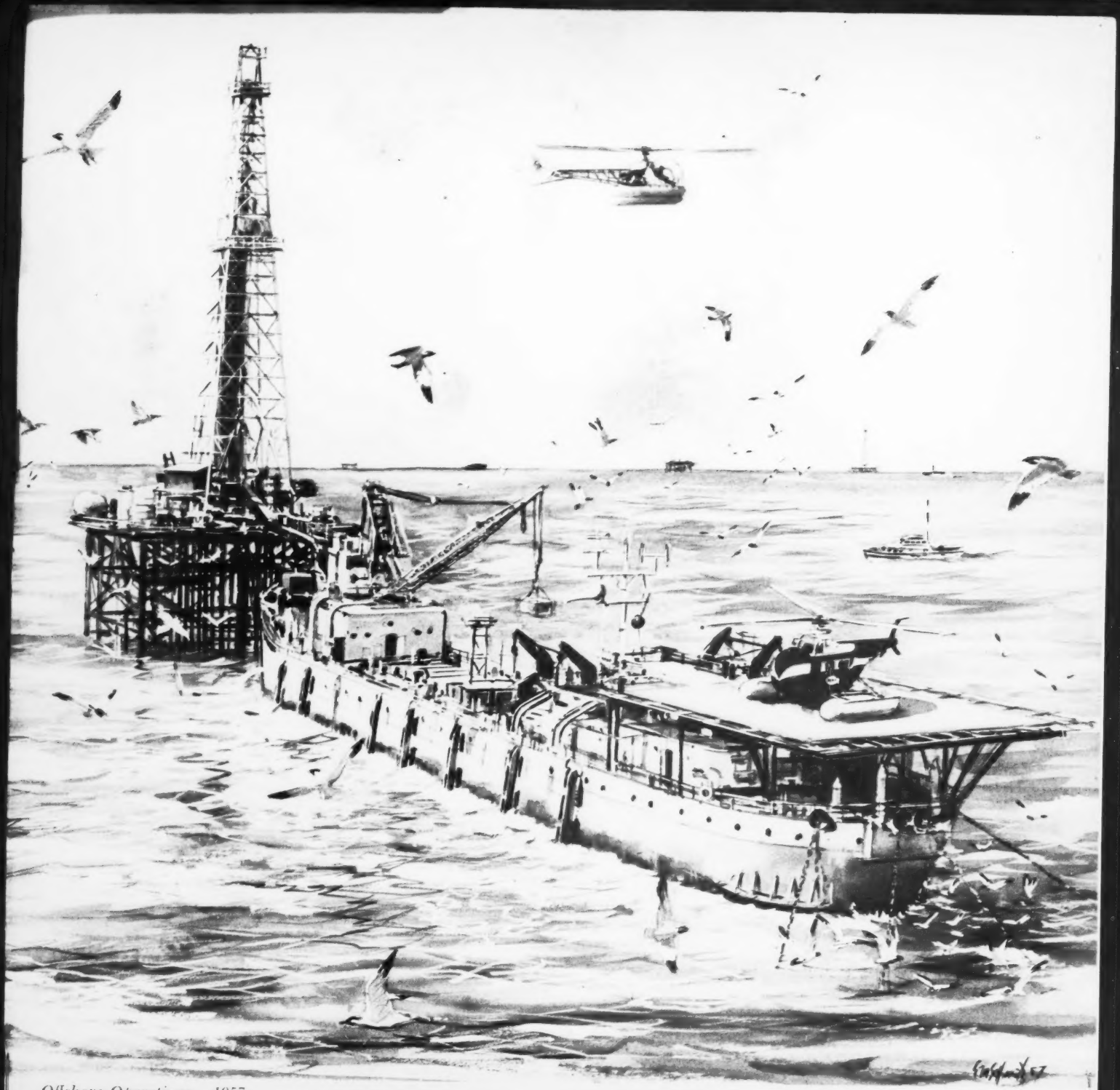


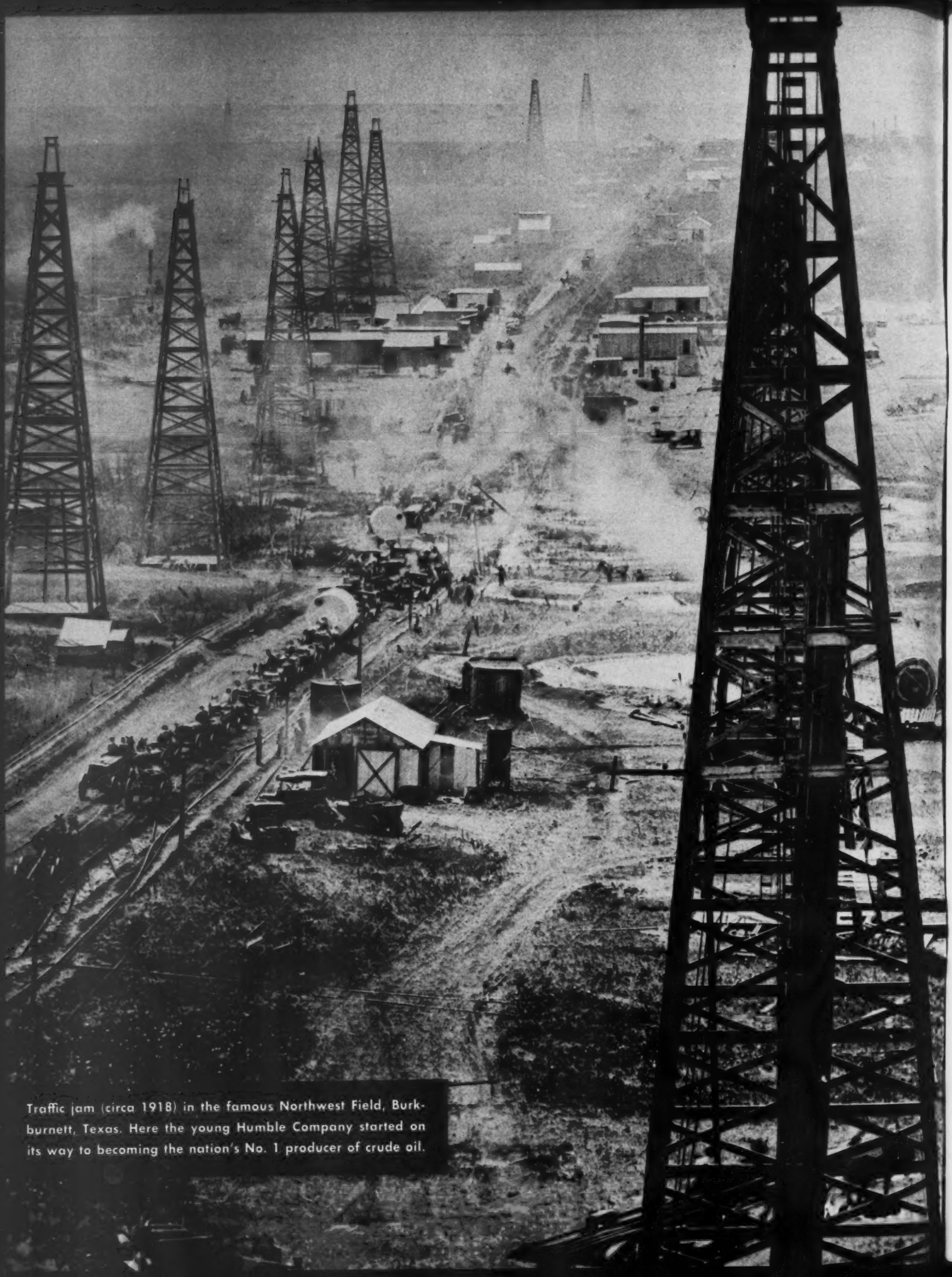
Offshore Operations – 1957

E. M. Schiwetz

The Humble Way

MAY-JUNE, 1957

40TH ANNIVERSARY EDITION

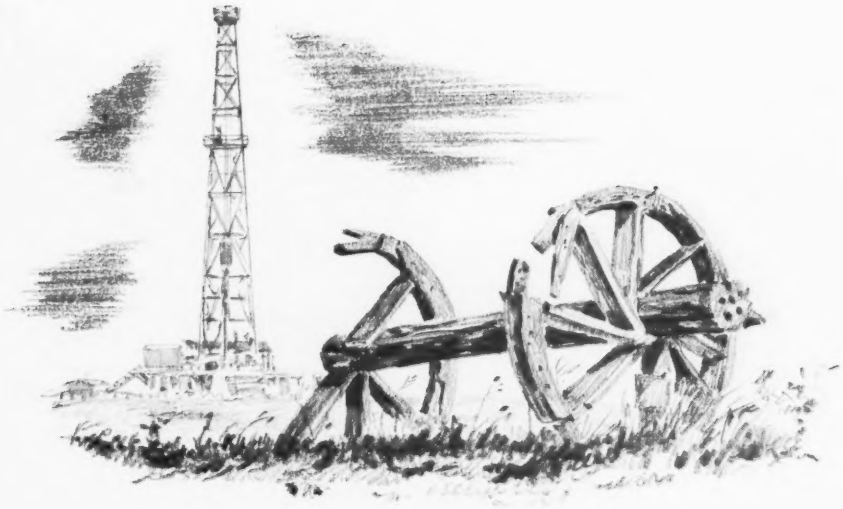


Traffic jam (circa 1918) in the famous Northwest Field, Burkburnett, Texas. Here the young Humble Company started on its way to becoming the nation's No. 1 producer of crude oil.

The Humble Way

May-June, 1957

Vol. XIII No. 1



THESE FORTY YEARS

ON JUNE 21, 1917, Humble Oil & Refining Company received its charter under the laws of the state of Texas.

In this 40th Anniversary edition a sincere effort is made to tell the story of the Company's four decades of growth and progress. In a broad sense, that growth and progress also reflect and illustrate the dynamic nature of the oil industry in Texas and in the United States.

Primarily, however, this is the story of Humble's own *progress through people*—of the founders, and those who followed them, who were willing to work hard and assume great risks in a business marked by unusual hazards and uncertainties. It is the story of sound business men in a highly competitive industry, who have had to adjust to changing times and conditions. It is the story of a constant search for new and better methods, new and better products.

Essentially, Humble's 40 years of progress is a story of *people at work*—of people who continue to take pride and satisfaction in being a part of an industry so vital to the national economy, security, and well-being.

But back of the work, and giving meaning to it, is this basic philosophy, set down as Humble's fundamental conceptions of its functions and dealings with others:

1. A corporation justifies its existence and endures only if it performs a worthwhile service.
2. In order to fulfill its mission and to endure, a corporation must be fair and square in its dealings with the public, with its competitors, with its shareholders, and with its employees.

These fundamental conceptions are the bedrock on which Humble relationships are built. On this foundation the Company stands; and if the superstructure is made to conform, it has every right and reason to endure, to expect public acceptance, and to receive in return fair treatment by the public. By the application of these conceptions, there should be no conflict between the Company (or any corporation which applies them) and the public. Likewise, there should be no conflict between the Company and its employees; their interests are common; they have a common economic destiny; and their every relationship becomes one of mutual helpfulness, understanding, and confidence.

That is the basic philosophy on which the Company was founded, and on which it steered its course of progress over these 40 years. It is the same philosophy which will continue to set a pattern for Humble's growth and progress as long as the Company endures.

FIRST BOARD OF DIRECTORS

R. S. STERLING
President

W. S. FARISH
Vice President

H. C. WIESS
Vice President

R. L. BLAFFER
Vice President

W. W. FONDREN
Vice President

F. P. STERLING
Vice President

C. B. GODDARD
Director

JESSE H. JONES
Director

L. A. CARLTON
Director

About the author

It was E. E. Townes, right, who drew up Humble Oil & Refining Company's charter in 1917. Before that, he and his partner in a Beaumont law firm had represented nearly all the interests brought together to form the Company.

Only a few months after Humble's charter was granted, Judge Townes was named to the Board of Directors and served as General Counsel. He became a Vice President in 1933, retired in 1943, and entered private practice in Houston.

We are grateful to Judge Townes for these interesting recollections of one who knew Humble from its beginning, and whose record of distinguished service spans 25 years with the Company.

How The Company Was Organized

BY E. E. TOWNES

IN 1901, when the Lucas gusher was brought in at Spindletop, the people of America stood at the threshold of a new and better way of life. In the years ahead, with abundant supplies of fuel energy from petroleum, they would produce more, have more, and live better than any other people in the world.

Before Spindletop, oil had served principally as an illuminant and as a lubricant. It had been too scarce to allow full development of the Machine Age. The Spindletop discovery, and others that followed, lifted the American oil industry from the age of kerosene into the age of fuel oil, and opened the door for today's age of gasoline.

Apart from its national significance, Spindletop had a special meaning which relates directly to this 40th Anniversary Issue. It was a most important event leading to the founding of Humble Oil & Refining Company, for it was at Spindletop that the men who were later to organize the Company were brought together in business dealings. And it was at Spindletop that these men made lasting friendships.

W. S. Farish had been practicing law only a few months in Mississippi when the Spindletop field was discovered. A business trip to Beaumont in the interest of one of his early clients led him into the oil business. He soon began to take an active part in drilling work, and during the years before the Company was organized took advantage of the opportunity to study the oil business from the ground floor.

R. L. Blaffer left his father's coal business in New Orleans at the time of the Spindletop discovery and came to Beaumont when the boom was on. He worked for a railroad for a time, but soon turned his attention to the oil business.

W. W. Fondren, another one of the original incorporators, began his career in an Arkansas saw mill at the age of 13. He had to help support his widowed mother, and when oil was discovered at Corsicana several years later the family moved there and he tried his luck in the oil business—probably as a roustabout. Through thriftiness he soon managed to buy a drilling rig and began drilling contract wells. He had gone to Beaumont and was drilling wells when the Humble field was discovered in 1906. His equipment, plus some leases and land he had purchased, were a part of the property of the Humble Company when it was organized.

One of the principal group of original stockholders was the Sterling family—Ross S. Sterling, Frank P. Sterling, and Miss Florence Sterling. Their father was a doctor and merchant in Chambers County, and he owned considerable livestock. Since all the equipment during those early boom days had to be hauled by teams, R. S. and Frank P. Sterling set up a chain of feed stores to supply the demand at Sour Lake, Batson, Dayton, Humble, and several other oil centers. The business prospered, and the three members of the family soon acquired interests in Humble and Goose Creek oil properties; also in Oklahoma. The Texas properties were in the name of Humble Oil Company, which the Sterlings organized, and in which they were the principal stockholders. At the time of organization, the Humble Oil Company properties were brought into the new Company.

"Boggiest rice field I had ever seen," as the site of Baytown refinery is described by E. E. Townes, seems to fit this picture made before construction was started.

Another block of properties came chiefly from the Wiess family. The father of H. C. Wiess was interested in the lumber business, but had helped to organize several oil companies before his death in 1912. H. C. Wiess had returned from college only a short time before, but now took over the management of the Wiess properties and brought them into the Company at the time of its organization.

The holdings and properties of J. C. Wilson, Frank Ireland, and Charles Goddard, along with the Schultz Oil Company, owned principally by Mr. Farish and Mr. Blaffer, and L. A. Carlton, Ed Prather and Bert Broday also were brought into the Company.

All of these individuals were operating independently, but around 1915 and the early part of 1916 independent operators were experiencing difficulty in selling their oil for the price they felt it was worth. About that time Mr. Farish made a trip East in an effort to sell to an Eastern refinery the oil which was accumulating on independent properties. When that refinery declined to purchase one cargo without guarantee that future shipments could be made, Mr. Farish returned and proposed the idea that the independent producers pool their production to insure a steady supply to the potential market.

The plan received more and more favorable support from the various groups I have mentioned before, and near the close of 1916 it was decided to form some sort of association. In February of the following year the various interests met to work out the plan more carefully, and it was agreed to put all the properties together March 1, 1917. The details of the permanent corporation, association, joint stock company, or whatever it was to be, were to be worked out as soon as possible, and from that day on all parties began to work their properties for the joint account.

L. A. Carlton and I were partners in a general law practice in Beaumont. We represented nearly all of these various interests, except the old Humble Oil Company which had been organized back in 1911 by the Sterling family and which had headquarters in Houston. So when our clients formed this new business and moved to Houston we naturally came along.

Our first job was to decide what character of organization this was to be. In view of legislation which was under discussion at the time there was some delay in obtaining our charter. We wanted the corporation chartered under the laws of the state of Texas, and so we had to wait until June 21, when the so-called "Texas Company Bill" went into effect.

So, the Humble Oil & Refining Company operated from March 1 until June 21 on nothing more than the oral promises of the parties concerned.

Watching 20,000-barrel-a-day well, West Columbia field, 1918, l. to r.: Humble scouts R. D. Farish, Howard Tullos, unidentified visiting scout, and Tom Bounds, Humble superintendent.

There was never a scratch of the pen about that agreement; it was based on friendship and faith. About $8,000,000 worth of properties were involved and there were about 25 parties to the agreement. They operated on their implicit trust in each other, and all were confident that the agreement would be carried out in spirit and in letter.

When we obtained the charter the Company was formally organized and stock was issued. The first board of directors included R. S. Sterling, Frank P. Sterling, W. S. Farish, R. L. Blaffer, H. C. Wiess, C. B. Goddard, L. A. Carlton, W. W. Fondren and Jesse Jones.

Mr. Jones remained on the board only five or six months. When he resigned, I was elected to fill the vacancy, early in 1918.

The consolidated production of the various interests at the time of organization was about 7,000 barrels daily. We had a little production at Humble and Goose Creek, some at Sour Lake and Batson, and some in Wichita County, in North Texas. Our only refinery was a little "washpot" affair with 300 barrels daily capacity. That was known as the Globe Refining Company, located at Humble. It was operated only on the high gravity freak oil from a single well.

Our first marketing efforts of refined products were made by Mr. Blaffer. Truck loads of gasoline from the Humble plant were hauled to Houston and sold to stations there.

Our pipe line system at that time was about three miles of gathering line in the Goose Creek field, which had been brought into the Company by the Sterling interests. Our first expansion came when we brought in the Burkburnett field in Wichita County. We built about eight miles of line to carry the oil from the field to Iowa Park, from whence we shipped it by rail to the Dixie plant in San Antonio.

The plant of the Dixie Oil & Gas Company in San Antonio had been purchased in July, 1917, and was our second venture in refining. There was a good market for gasoline in San Antonio, and practically the whole output of the Dixie plant, refined from the crude oil shipped from Burkburnett, was consumed in that vicinity.

We also acquired, along with the Dixie refinery, four service stations located in Austin, Corpus Christi, Seguin and Yoakum. This was our first expansion in the sales end.

When the Ranger boom started in 1918 and the West Columbia field was brought in, our production began to increase. At the end of 1917 the Company had 230 producing wells with an approximate average of 13,000 barrels of daily production. Mounting production from large holdings acquired in the two new fields led to the need for greater refining facilities.

That was when Baytown was born. I remember going down there to investigate some controversy about the land on which the plant is built. It was the boggiest rice field I had even seen. It was just a wilderness, and I assure you that after looking it over in August of 1918, I never dreamed it would become the huge plant it is today.

There are of course other interesting things about the growth and development of Humble Oil & Refining Company, but most of them will be presented elsewhere in this 40th Anniversary Issue.

The Company's story has been one of progress. Naturally, all of us are proud of its physical growth, but I am sure that the greatest source of satisfaction to those men who founded the enterprise was the great human organization it came to be. During the past 40 years, the Humble family has grown to more than 19,000 people.

Gratifying too, is the knowledge that the principles of fair dealing and mutual confidence which enabled the original group to pool their interests and operate for several months without the scratch of a pen, are still the guiding principles of the organization today. To those principles, more than to any other reason, I feel that the Humble Company owes its success.

"... A SOUND BEGINNING WITH MEN OF CHARACTER AND ABILITY..."

Excerpt from Hines H. Baker's statement to Shareholders at Fortieth Annual Meeting.

THIS is a significant anniversary meeting of Humble's shareholders. Forty years ago last month plans were consummated for the merger of properties of a number of independent operators to form Humble Oil & Refining Company. Thus was created what is now the largest domestic producer of crude oil. And thus were brought together as its founders a remarkable group of men who have made for themselves an important place in the annals of the oil industry. R. S. Sterling and his brother, F. P. Sterling, the principal organizers of Humble Oil Company, from which the present Company acquired its name; W. S. Farish and R. L. Blaffer composing Blaffer & Farish; H. C. Wiess with assets from Paraffine and Reliance Oil Companies; Walter W. Fondren and C. B. Goddard, producers; and L. A. Carlton and E. E. Townes as lawyers; all of these had important parts in the origin and early development and growth of Humble. Four of them have served as a president of the Company, and all of them contributed greatly in adopting the principles, in shaping the policies, and in laying out procedures that have guided the Company's progress through these forty years. Mr. Harry C. Wiess was the last of these in point of service. His active career ended in 1948. But his influence and that of the other founders will survive as long as the Company continues.

"These organizers laid a solid foundation with their merged properties, their integrity of character, the basic policies and principles which guided the Humble Company, and the sound business standards and judgments which they brought to bear upon the Company's problems and operations. The Humble Company thus had a sound beginning with men of character and ability. They possessed courage and business judgment. They established high standards of performance. They built a strong organization of competent men and women. The results stand as a tribute to their leadership, vision, and work.

"But it is to be doubted that any of these founders at that time visualized the changes that have occurred in the oil industry, or the size and complexity of the present day Humble Company or the extent of Humble's contributions through the years to the progress of our society."

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HINES H. BAKER

THIRTY-EIGHT YEARS OF DISTINGUISHED SERVICE

HINES H. BAKER, whose career with Humble spanned 38 of the Company's first 40 years of growth and progress, retired as President and Director on April 29. On May 22, he was elected to the Board of Directors of Standard Oil Company (N. J.), and at the Board meeting following, he was elected a Vice President and was appointed to the Executive Committee.

A native Texan from Bandera County, Mr. Baker was graduated in 1917 from the University of Texas as a Phi Beta Kappa with degrees in liberal arts and law. His law career, begun with the Beaumont firm of Foster & Hardwicke, was soon interrupted by World War I. Following his discharge as a Lieutenant of Artillery in December of 1918, he entered into a law partnership in Beaumont, Texas, with his brother, Rex G. Baker, now retired Vice President and General Counsel of Humble Oil & Refining Company.

In October of 1919, Mr. Baker joined Humble's Law Department, which at that time consisted of five men. He was first engaged in handling law matters concerning the purchase of crude oil, in working on titles and abstracts, and in advising the Production and Refining Departments in legal questions affecting their operations.

Mr. Baker's entry into the oil industry coincided with the upward surge of Texas oil production resulting from the discovery of such fields as West Columbia, Powell, Mexia, Ranger, and Breckenridge. And when he joined Humble, the Company was just beginning to expand its refining effort. These two major activities, production and refining, occupied the early attention of the young lawyer, and had a great part in shaping the course of his business life.

Humble was among the first oil producers to recognize the necessity for a sound oil conservation program which would have its basis in law. Its early day technical people had recognized some of the basic principles involved in the prevention of waste, and Hines H. Baker was one of the early oil lawyers to work seriously on the legal aspects of oil conservation. His has been an important contribution to the development of this vital phase of the oil producing industry.

In the course of his career with Humble, Hines H. Baker took an important part in cases which established basic principles of oil and gas law and corporation law in Texas.

In *Danciger Oil & Refining Company v. Railroad Commission* (State Supreme Court, 1933), he assisted the Attorney General in establishing the power of the Railroad Commission under the Texas conservation laws, in order to prevent waste, to restrict oil production to reasonable market demand and to require ratable withdrawals from different leases in an oil and gas reservoir.

In *Brown v. Humble Oil & Refining Company* (1935), the Texas Supreme

". . . THE ENTIRE HUMBLE FAMILY WILL MISS HIM . . ."

Statement by J. A. Neath, Chairman of the Board, at the Fortieth Annual Meeting of Shareholders

"Mr. Baker has been presenting these reviews of Humble's operations at stockholders' meetings here for almost ten years. As I sat and listened to him today, it was hard for me to realize that this would be the last one he would make at our meetings.

"It was with deep regret that the Board learned of his decision to leave the Company.

"Since he joined the struggling young Humble Company in 1919, he has dedicated himself to the principles of honesty and fair play for which the Company has always stood. The vigor with which he has attacked problems has been a source of inspiration to those of us who have had an opportunity to work closely with him through the years. We have marveled at his energy, his analytical ability, his keen, mature judgment and his tremendous capacity for work.

"In addition to his work with the Humble Companies, he has always given generously of his time and efforts to the problems of the petroleum industry. He has served for many years on important industry committees of the American Petroleum Institute and the National Petroleum Council.

"Mr. Baker has also found time to contribute greatly to civic and church life in our community here in Houston.

"On behalf of the directors, I would like to express to him our sincere thanks and appreciation for his splendid leadership and for the great contribution he has made to the growth and stability of the Company. We want him to know that the entire Humble family will miss him and our best wishes go with him as he assumes new responsibilities."

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Court adopted the principle, asserted in briefs and oral argument by Mr. Baker, that the Railroad Commission must protect the correlative rights of property owners when it regulates their use of their properties. In that case, the Court held also that the "rule of capture" does not govern ownership of oil in place in Texas, but merely recognizes the owner of a well as the owner of oil produced from that well.

Earlier, in 1924, Mr. Baker assisted in securing recognition by the Texas courts that a foreign corporation merely by owning stock in a Texas corporation and voting that stock at stockholders' meetings is not thereby doing business in the state. Another case of great importance and prominence in which Mr. Baker participated actively was *State vs. Standard Oil Company*, an anti-trust suit brought by the State Attorney General in 1931 against a large number of oil companies, including Humble.

During the years when the producing branch of the business was developing and rules of conservation were being evolved, the Company's refining business was also increasing. Hines H. Baker, the lawyer, was having an active hand in the contractual arrangements under which the refined products were sold. In doing so, he built up an intimate knowledge of the business part of the Company's refining operations and its attendant problems.

In addition, as an assistant to the Company's General Counsel, Mr. Baker had a hand in every phase of the Company's business as it was being developed during the period of its early expansion. Rights and obligations under oil lease agreements were not fully defined nor definitely catalogued under the laws of that day, and these basic problems had to be met and resolved as they arose. Mr. Baker also dealt with pipe line and traffic department matters and with questions relating to patents. In addition, he participated in much trial work.

Thus, as time passed, Mr. Baker became more and more closely associated with the executive and administrative aspects of the Company's affairs. In 1937, he was elected to the Board of Directors. Three years later, he assumed charge of Refining and Sales. In 1941, he was elected Vice President, and in the rearrangement of executive duties that took place in 1945, he was named Executive Vice President. In 1948, Mr. Baker became Humble's fifth President.

As spokesman for the oil industry and for the Company, Mr. Baker has appeared many times before Congressional committees and other groups. On those occasions he rendered distinguished service by interpreting and clarifying, for those groups and for the public, complex matters relating to oil operations generally and to Humble particularly.

In addition to his accomplishments as a lawyer and executive with Humble, Mr. Baker has a long record of distinguished service to his community, state, and nation.

During World War II, he gained national recognition for his work in high posts with the Petroleum Administration for War. He is a past director of the American Petroleum Institute and a member of the National Petroleum Council. He is a past vice president of the Houston Chamber of Commerce, in which he still holds membership.

In 1952, Mr. Baker received from Texas Christian University the honorary degree of Doctor of Laws. Also in that year he was awarded the Good Citizenship Medal by the Texas Society of the Sons of the American Revolution. In 1953, he received that year's Distinguished Service Award from the Texas Mid-Continent Oil and Gas Association. In 1956, he received the Brotherhood Award from the Houston Chapter of the National Conference of Christians and Jews.

A devoted worker in the interests of his Church, Mr. Baker is known as an outstanding Methodist layman who gives generously of himself, his time, and his means. As an alumnus of the University of Texas, he is deeply dedicated to helping with the affairs and progress of his alma mater. He helped organize the University's Development Board and served for seven years as its Chairman. He is also a past president of the University of Texas Ex-Students Association, in which he has been active for many years.

". . . HIS EXAMPLE WILL SERVE US IN GOOD STEAD . . ."

Statement by Morgan J. Davis, President, at the Fortieth Annual Meeting of Shareholders

"I WELCOME this opportunity to reiterate and to emphatically agree with Mr. Neath's remarks regarding Mr. Baker. It has been my rare privilege to know Mr. Baker well for the past 30 years, and an even greater satisfaction to serve with him for the past nine years I have been on the Board.

"I know Mr. Neath's estimate of Mr. Baker is accurate and not in the slightest degree an over-statement. During the past year I have had the privilege of working on an assignment that has brought me into even closer contact with Mr. Baker. I, like Mr. Neath, have marveled at the tireless energy and the expertness with which he discharged his many responsibilities and duties that came to him during that period . . .

". . . In succeeding Mr. Baker, I have a deep sense of humility as to my own qualifications for taking his place and a real appreciation of how difficult it will be to measure up to his performance . . .

"I know that the example Mr. Baker has set for my associates and me is one that will serve us in good stead in the years to come and that reflection on his handling of difficult problems will help us to avoid possible pitfalls into which we might otherwise fall . . .

"Again, I want to thank Hines H. Baker for his example, his help and counsel—all of which have been so valuable to me."

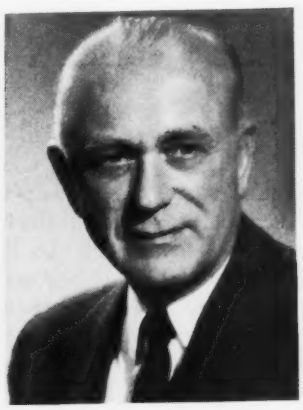
BOARD OF DIRECTORS, 1957

AT THE 40th Annual Shareholders' Meeting in Houston on Monday, April 29, these men were elected Directors for the year. At the Directors' meeting immediately thereafter, the following directors were also elected officers: Morgan J. Davis, president; J. A. Neath, chairman of the board; C. E. Reistle, Jr., executive vice president; H. W. Ferguson and Ralph J. Schilthuis, vice presidents; Richard J. Gonzalez, treasurer; and Nelson Jones, general counsel.

MORGAN J. DAVIS
Director and President

J. A. NEATH
Director and Chairman of the Board

C. E. REISTLE, JR.
Director and Executive Vice President



H. W. FERGUSON
Director and Vice President, Refining and Sales

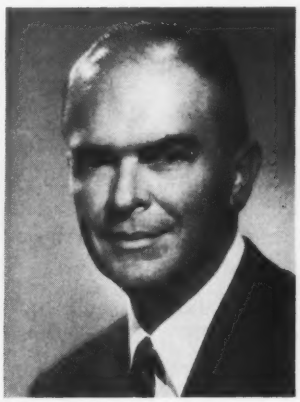
RALPH J. SCHILTHUIS
Director and Vice President, Production

RICHARD J. GONZALEZ
Director, Economics and Statistics, and Treasurer

HERMAN P. PRESSLER
Director, Crude Oil Marketing and Transportation

RAY H. HORTON
Director, Employee Relations and Purchasing

ED J. HAMNER
Director, Exploration



NELSON JONES
Director and General Counsel

A Southwest Texas geophysics crew moves caravan-like to a new location. Included in the winding line-up of vehicles are automobiles, service trucks, shooting and recording trucks, and house trailers in which crewmen live while systematically exploring the big expanses of that area.

PROGRESS IN FINDING OIL

IN THE early days of the oil business, there was no such thing as scientific exploration. The search for oil was largely a hit-or-miss operation in which practical oilmen grasped at any clue which experience seemed to indicate might help locate good prospects.

In those days, people with practical experience sought for what they called "obvious surface evidence"—oil or gas seeps, oil slicks or gas bubbles in water bodies, waxy paraffin dirt, or unusual indications such as mounds or hills in flat coastal areas.

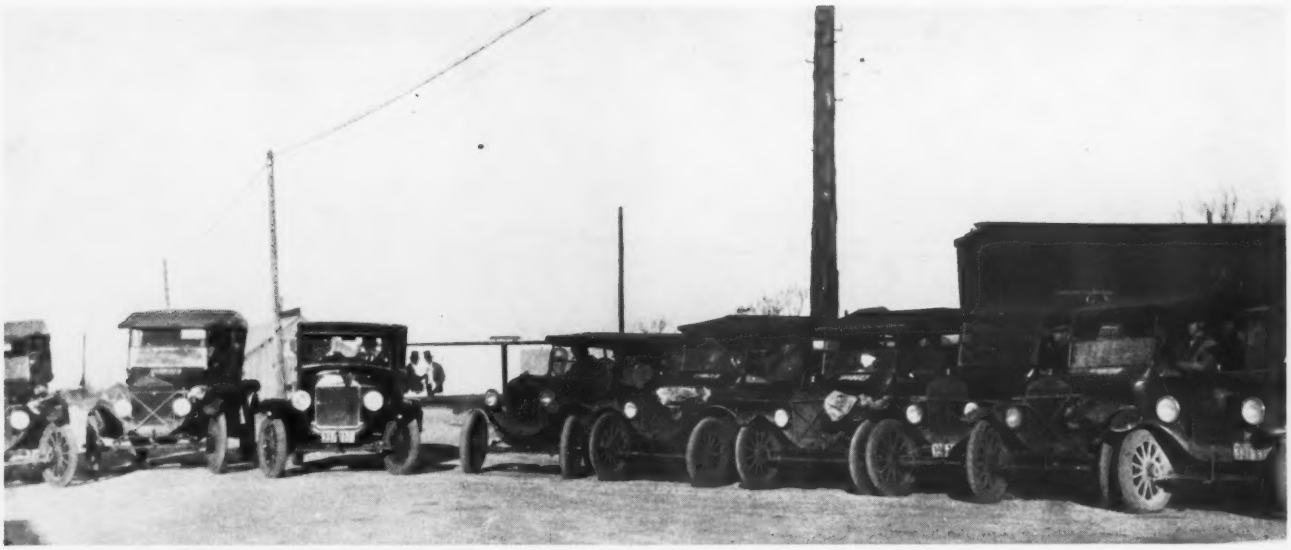
Later on, surface indications came to be integrated with other and less apparent clues by geologists, leading to a growing need for men trained in geology. It was not until 1913, however, that geology was seriously applied to the search for oil. And even then it was used only in a few selected places.

It is not surprising, then, that Humble Oil & Refining Company operated for almost a year after its founding without the services of geologists. The nearest thing it had to an exploration group was a Land Department, placed in operation in October, 1917. Even then, as a matter of practice, leases were approved by any one of several directors—or, occasionally, by production superintendents. In the absence of geologic information, much reliance was placed on data gleaned by scouts in the field.

In 1918, Wallace E. Pratt—a man destined to become one of the nation's foremost in his field—came with Humble as the Company's first geologist. Three more geologists were added during the same year, and seven more were employed in 1919.

Until 1920, most of the talents of Mr. Pratt and his men were confined to oil-finding activities in North Texas. In that year, however, Mr. Pratt moved to

Land and leasing group, 1922, forerunner of the Exploration Department, included l to r, back row: A. C. Smith, T. H. Farish, J. H. Meek, N. E. Tanner, R. D. Farish, Hugh Gill; second row, R. O. Frame, David Frame, Frida Pitschman, R. G. Carr, Mrs. C. C. Thrift, H. E. Wright, P. O. Dowlen; front row, Carris Ezell, L. J. Tillery, T. H. Salter, H. S. Tullis, Ben K. Bering, Jr., and R. B. Cooper.



This 1926 geophysical crew, motorized and completely equipped, presents a sharp contrast with the modern crew on the adjoining page. Geophysics group was set up in 1924, and Humble began to build its own equipment. The first seismograph recording was made in 1925.

Humble has discovered or developed 93 per cent of its crude oil reserves; only 7 per cent has been acquired through purchases

Houston; district offices were opened in Shreveport and in Ardmore, Oklahoma.

Logically for that time, interest and activity centered around surface geology, followed by extensive mapping. But before long, subsurface work began to supplement those activities, with cuttings from underground formations being analyzed at the Company's geologic laboratory in Houston. In these analyses, micropaleontology played an important part, and Humble may be regarded as a pioneer in the use of that science as an oil-finding aid. In 1920, Humble employed its first micropaleontologist. Two years later, using light rigs, the Company began to do shallow core drilling specifically to provide samples for laboratory analyses.

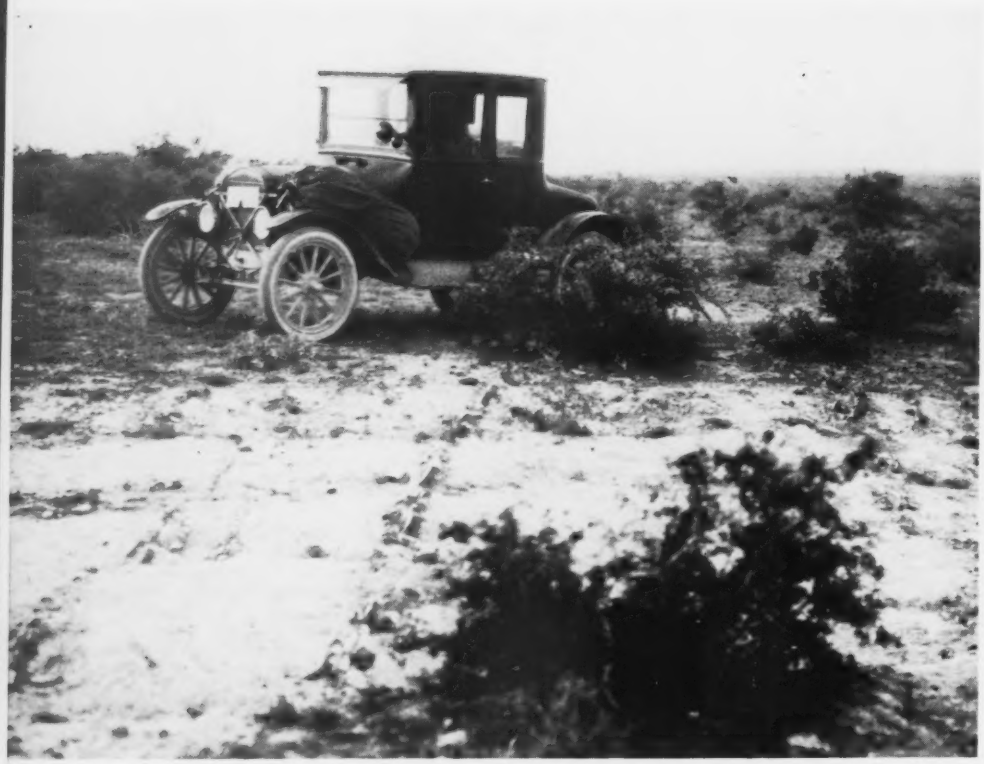
One of the most notable early contributions by Mr. Pratt and his staff was the geological interpretation at Mexia. On the basis of information drawn from such studies, Humble bought well-located leases and developed substantial reserves and production. This work, and the leasing of large amounts of acreage that proved productive at Powell in 1923, are generally considered to have firmly established Humble as a producer.

Early Geophysics

As early as 1922, geophysical instruments had been used experimentally by others on the Gulf Coast as a new method to try to find otherwise undetectable salt domes. After carefully studying the results of this work, Mr. Pratt concluded that Humble should make use of geophysical instruments and methods. He later recommended to the Board of Directors that Humble build its own equipment, develop its own geophysical staff, and do its own research.

In line with these recommendations,

On a field trip some years ago to Sitting Bull Falls in the Guadalupe Mountains of New Mexico was this group of geologists, all of whom spent long years in exploration work for Humble. Left to right: Wallace E. Pratt, Humble's first geologist, William B. Hoover, Sol Bunnell, John W. Skinner, Morgan J. Davis, now Humble president, Richard D. Holt, and L. T. Barrow, former Chairman of the Board of Directors.

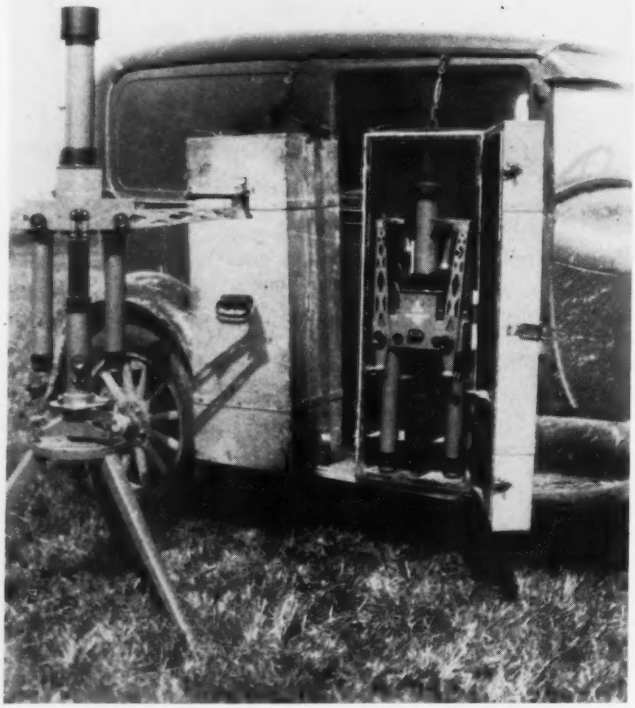


The prominent fault shown in the foreground is the object of study for the surface geologist whose Model T stands here. Surface geologists often work alone; lead an outdoor life.

as approved by the Board, a geophysics group was set up in 1924 and a shop established at Houston for geophysics research and development. Work on design, development, and manufacture of a refraction seismograph and accessory equipment was pressed rapidly. One seismograph was ready for field trials by April of 1925, and before the month was out a crew had made Humble's first seismograph recording in the field.

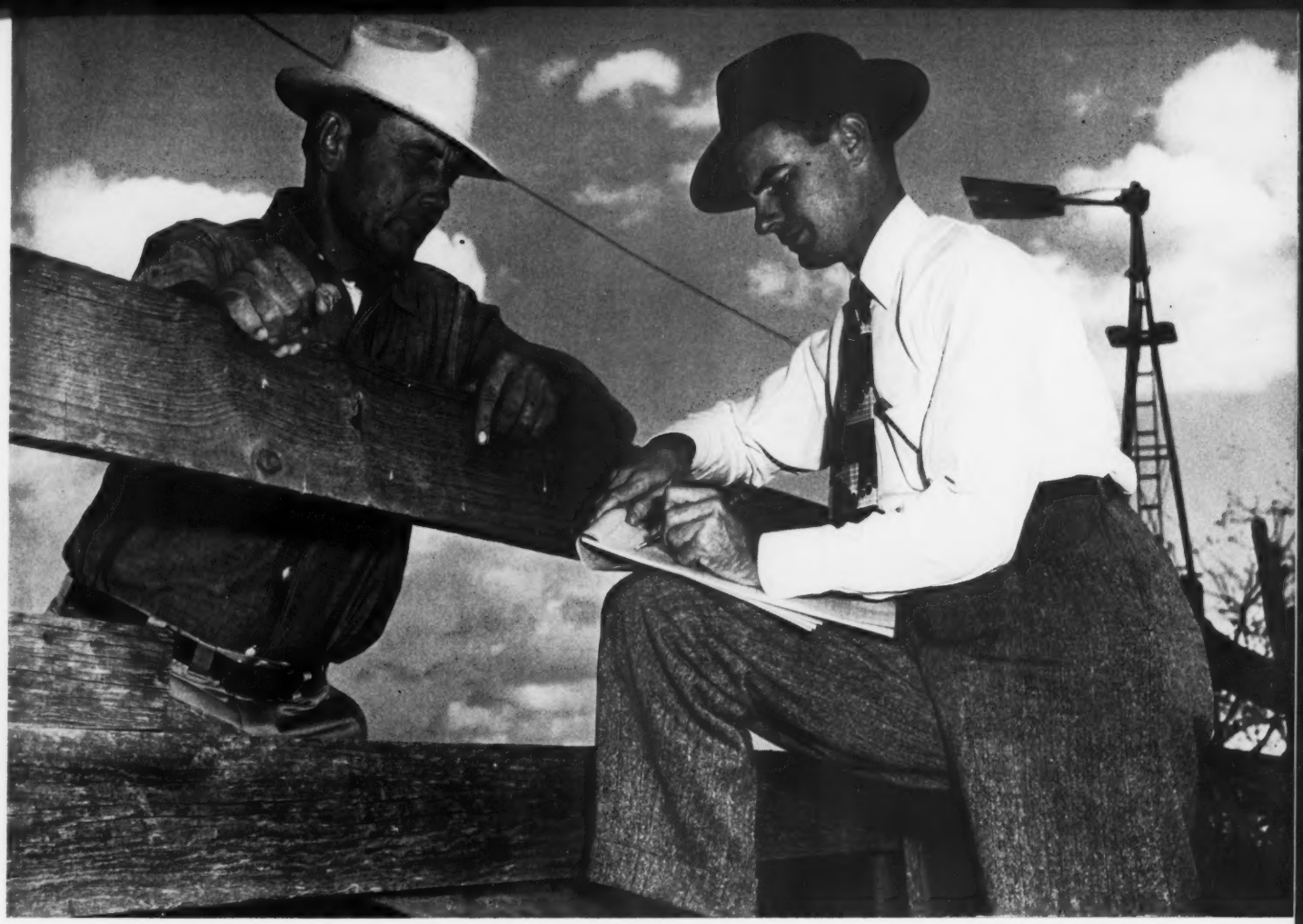
In August of 1925, a second refraction seismograph was sent to the field. Meanwhile, in mid-year, two torsion balance crews had begun work with equipment ordered earlier in the year from Hungary. This was noteworthy progress by a group that had begun work only a scant year earlier.

Humble's exploration activities continued to make good progress during the mid-Twenties. More geophysical instruments were added and additional crews took their places in the field. On June 1, 1926, the Company discovered its first oil field by geophysical means when a refraction seismograph crew found the Moss Bluff salt dome in



Early geophysics equipment in the field. Stressing improvements as rapidly as possible, Humble made good progress during the middle '20s.

Larger shots and longer shot lines were used along the Texas Coast in the late '20s to locate deep salt domes where oil might be found.



Humble's leasing policy was changed about 1927 from the old scattered "checkerboard" method to one of leasing large blocks, where wise and practicable. This led to development of fields in orderly manner, with emphasis on well spacing for production efficiency.

Liberty County on the Gulf Coast. By 1927, Humble had three refraction seismographs, seven torsion balances, and a half dozen magnetometers engaged in the search for oil.

New Leasing Policy

The work of exploration personnel, of course, was aimed at helping to answer the Big Questions: Where shall we lease, how much acreage shall we take, and how much shall we pay for it?

In earlier days, answers to those questions had fallen within the province of the Board of Directors, though in practice a decision might be made by a single Director, or by production superintendents in the area. As Board members became more concerned with other responsibilities, however, decisions to lease came more and more within the authority of the Chief Geologist, and, through him, the Division Geologists. This was especially significant in areas where oil play developed quickly, bidding grew fiercely competitive, and on-the-spot decisions were often essential in acquiring valuable acreage. Such an arrangement made Humble's leasing work quite flexible.

At first, Humble's usual policy on leasing was to acquire proven properties or leases in or near proved production. It would estimate the direction in which a new field was likely to move and would then try to lease desirable acreage before demand came with a rush and forced prices upward. Because geological information was scarce or entirely lacking in the early days, the policy was to buy leases in scattered "checkerboard" patterns.

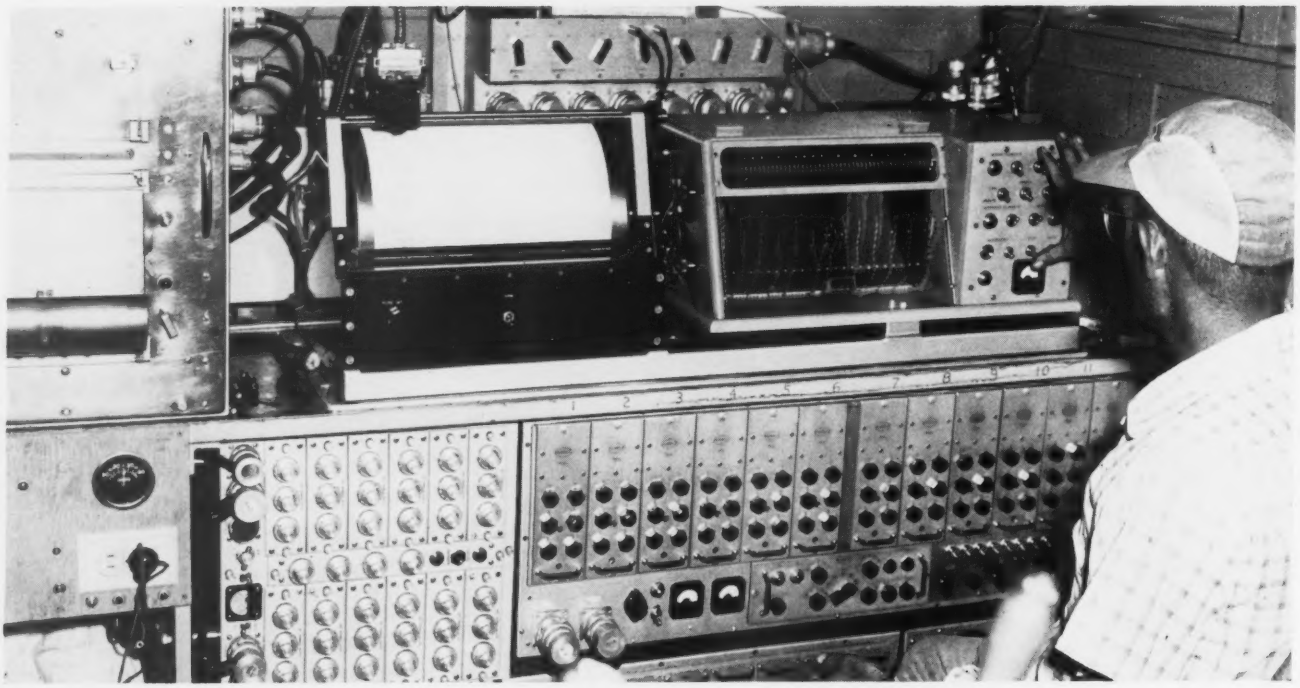
By 1927, however, Humble had made a significant change in its leasing policy. No longer did the Company lease by the scattered "checkerboard" method, or remain wedded to its policy of acquiring leases only near proved production. It was particularly careful to avoid checkerboard leasing in regions where development of large pools was likely. Instead, the leasing policy was switched to one of leasing large blocks, insofar as wise and practicable.

This change in leasing policy reflected a new executive attitude toward production problems. Management had become convinced that the best solution for problems of competitive drilling (with attendant flush production, high costs, low recovery, and waste) was to develop an oil pool as a unit. The ultimate to be desired, of course, was a field exclusively Humble's, to be developed in a manner most consistent with efficient operation.

Locating Promising Lands

The success of block-leasing depended on the capacity of Humble's Exploration Department to locate lands which indicated promise. Fortunately, 1927 proved quite successful for exploration work. A well was brought in that year at Boggy Creek in East Texas. In that same region, salt domes were indicated at East Tyler, Whitehouse, and Mt. Sylvan.

In March of 1928 Humble completed its first well at Sugarland, just a few miles southwest of Houston in



Sensitive pickup equipment like this, developed over years of research and field trials, is built into modern geophysics recording truck in Company shops. Trained operators accumulate far more dependable information today than was possible with the models of 30 years ago.

Photogeology is one of the newer methods being used with surface and subsurface geology and paleontology for more accurate geologic information. Here geologist studies aero-photo map.

Fort Bend County. Scouts had reported leasing activity there after a torsion balance survey, but a test well drilled by others turned out to be a dry hole. Using the seismograph, Humble itself had shot the area with small charges and short shot-lines. It went back and used larger shots and longer lines; the results indicated a salt dome. Later, Humble obtained leases on nearly the whole field and proceeded to develop it on an orderly basis, with due regard for well spacing in the interests of conservation.

The knowledge that larger charges and longer shot-lines were useful in locating deep salt domes set off a search that took crews from other areas down to the Gulf Coast, in Texas and Louisiana. Meanwhile, geophysics surveys indicated interesting places on the Texas coast, including Friendswood.

Research and Improvement

By the end of 1930, an expanded research group had made good progress in geophysics. Instruments had been improved and made more useful in the watery, swampy areas of Louisiana and Texas. The gravity meter had been improved until it gave definite promise of being effective. This was especially important, for it was a most likely substitute for the slow and cumbersome torsion balance.

Most important of all, great improvements had been made on the seismograph. A new type had been developed, the *reflection* seismograph, which soon replaced the less efficient and shorter-ranged refraction instrument which had been used up to that time. Humble's future exploration success, it was now clear, would depend in large measure on the results obtained through teamwork among men trained in the oil-finding sciences of geology and geophysics.

Geologists Afield

In February of 1928, Humble completed its first oil well in the Raccoon Bend field, which became an important Gulf Coast producer. Some small production was also established on the basis of geologic evidence in West Texas and in the Panhandle. The real successes in geology were scored during 1927-1930 in Southwest Texas, an area which previously had proved disappointing to Humble's hopes.

In 1928, a successful oil well was completed by another company near Humble's acreage at Salt Flat, near Luling in Caldwell County. Humble eventually owned a substantial part of this field and developed considerable production there. Acreage was also acquired as a result of surface geology at Darst Creek in Guadalupe County. Here again, the discovery well was drilled in 1929 by another company near Humble's block of acreage.

Rapid Growth and Development

The real growth of Humble's production and reserves which began in 1928 advanced rapidly through the 1930's and has continued to the present. From 1928 through 1956, the total number of employees in exploration has increased nearly tenfold—from 199 to 1,901. The number of wells drilled each year has nearly quadrupled since 1928—from 247 in that year to 905 in 1956.

Humble's tenacity and foresight were reflected in its wise aggressiveness during the depression. The number of wells dropped in 1930, but the number of exploration employees increased from 313 to 320, and a vigorous search continued for new prospects. Drilling in the East Texas Field, coupled with other developments, brought the Company's total wells drilled during 1931 up to 503.

Production geologists who sit on all wells drilled by the Company analyze cores and study cuttings from the mud stream to gain information needed to guide wells to successful completion.

Maps are vital to exploration people. Thousands of maps are kept up to date with data gathered by geologists, geophysicists, scouts, landmen, and a host of other field specialists.

The Grand Canyon of the Colorado is the subject of study for these two surface geologists. Others plod over wide expanses of territory to study less imposing subjects: creek banks, highway and railroad cuts or surface outcroppings which may reveal information on what lies below.

Generally, drilling was at a high level for the next few years after 1931. An all-time-high peak of 1,271 wells was reached in 1937. In that year, the number of exploration employees had increased to 548.

Total wells drilled declined between 1938 and 1941, but only a small decrease was noted in exploration personnel. Humble's production and reserves increased during the period, however, through discovery and development drilling.

Before World War II, Humble's exploration activity, expanded in size and diverse in its work, had taken its place as a major segment of the Company structure. Practically all phases of exploration work now in progress were in existence by 1941. Geographical divisions and smaller headquarters had been established for more efficient operations.

Exploration work was most severely taxed during World War II. With greatly reduced personnel (reaching a low of 366 in 1942), vitally necessary work was still accomplished successfully. Although the greatest reduction was in technical people, those who remained worked strenuously and long to carry on successful projects.

Total wells drilled declined from 589 in 1941 to a low of 252 in 1943, but was built back to 573 in 1945. Wildcats, however, increased from 28 in 1941 to 80 in 1945—with a peak of 96 in 1944. Production of crude oil more than doubled between 1941 and 1945, and reserves declined slightly.

Post-war Operations

A year of re-grouping came in 1946. Employees returned from military service and new people were employed, increasing the number of personnel from 632 at the end of 1945 to 805 in 1946. Drilling increased to 685 wells in 1946, 114 of them wildcats. Reserves and production both increased during the year. As exploration continued to expand, it was evident that further re-grouping was necessary.

In 1948, the Department was reorganized and consolidated. Before that time the geologic, lease, and scouting activities were carried on under the chief geologist and the geophysical work under the chief geophysicist—each operating in effect as separate departments directly under the supervision of a director.

By this time, however, it had become increasingly clear that the geologic and geophysics groups were inseparable members of an exploration team. In addition, the continuous growth and expansion of the Company in the post-war years made it necessary to integrate these activities and bring about closer coordination between them. To accomplish this, the Exploration Department was established under a manager to consolidate completely the exploration effort.

In this reorganization plan, the exploration research activities were also strengthened with the organization of a geologic research section, an enlargement of geophysics research, and a closer coordination of the two.

Geophysics crews penetrate the densest, most forbidding swamplands along the coast of the Gulf states and even go out into the rough waters of the Gulf. Others trek the flat desert wastes and scale craggy mountains—all in search of possible oil-bearing underground structures.

The foregoing arrangements spread the managerial work load and provided for smoother liaison between management and the operational divisions. Decentralization of authority to carry on normal day-to-day functions was effected by authorizing the division geologists to assume the responsibility of making their own decisions within specified limits, which enables them to act on vital questions more promptly.

Organizations in the seven geographic or operational exploration divisions and areas were thus more firmly strengthened and consolidated in the function of finding oil. Each division organization became, in effect, a replica of the department plan which permitted more of the work and problems of the various areas to be handled locally.

Area of Search Expanded

One dramatic outgrowth of expanded operations during the past decade or so has been exploration offshore on the Continental Shelf in the Gulf of Mexico and in the Pacific Ocean off California. The Department's territory has now been extended until it stretches from Florida through the southern belt of states and up through the West Coast. Most recently, exploration has gone forward in Alaska.

Some idea of the Department's growth and progress can be drawn from these changes, all between 1947 and the end of 1956:

1. Personnel more than doubled—from 917 to 1,901.
2. Seismograph crews increased from 16 to 27.
3. Gravity meter crews increased from 6 to 10.
4. Wells drilled increased from 575 (103 wildcats) at a cost of $50.5 million in 1947 to 905 (152 wildcats) at a cost of $125.7 million in 1956. In two peak years during that period, more than 1,100 wells were drilled.
5. Crude oil production increased from 145.2 million barrels to 153.7 million barrels—in spite of reduction in producing days in Texas from 324 in 1947 to 190 in 1956.
6. Lease purchases increased from 1.56 million acres costing $9.8 million in 1947 to 2.9 million acres costing $29.6 million in 1956. The peak year was 1955, when 2.8 million acres were leased for more than $46.4 million—of which $18.5 million was for offshore leases.
7. Increase in lease rentals from slightly more than $7 million in 1947 to slightly more than $11.5 million in 1956.

The phenomenal growth of the oil industry in size, scope of activities, and competition points up clearly the tremendous job facing those companies who would increase—or even maintain—their competitive position. In the years ahead, exploration will join other operations in putting forth every effort to make sure that Humble retains its position of leadership in the petroleum industry.

Friendswood field, near Houston, discovered in 1937, was developed in orderly manner, and has produced efficiently and continuously for 20 years without artificial lift. This field, and others developed during the 30s, enabled Humble to double production for war needs.

PRODUCTION . . .

THERE is no chicken-and-egg, or which-comes-first, dilemma in the petroleum industry. First must come the oil. Before the consumer can enjoy the benefits of petroleum products, the drilling bit must unlock nature's storehouse, the oil must be brought to the surface and started on its way to market. *Production,* this phase of the industry's work is called, and it is a field in which Humble has been one of the nation's leaders for four consecutive decades.

The story of Humble's production is one of many facets. It is a story of native ingenuity and cut-and-try methods in the early years, of ever-widening research and advancing technology as time passed by. It is a story, too, that reflects Humble's contributions to the great and continuing achievement known as conservation. Overall, it is a story of growth and progress.

From the very start, Humble was a vigorous and prolific producer of oil. Born into a world of boom-town drilling and open-flow wells, the young Company almost doubled its daily production in less than a year's time. Its original properties had an output of only about 7000 barrels a day, but by the end of 1917 this had been increased to 13,000 barrels—enough to rank Humble fifth among Texas oil producers. The following year, it took another climb up the production ladder—to third place.

Thus, at the beginning, was established an emphasis on production which was later to bring Humble to the position it now holds and which it has held continuously since 1943—that of America's largest domestic producer of crude oil.

This emphasis upon production was only natural, for Humble's founders were first and foremost producers of oil. Of the Company's nine original directors, seven were veterans of those tumultuous early years at Spindletop—the birthplace of the modern producing industry. The other two made their plunge into the risky but exciting oil producing business in 1911 and 1914. Their experience, as a group, ranged from leasing activities to the actual drilling of wells.

By the spring of 1917, these men were ready to set their sights on an integrated operation. They had hitherto worked through partnerships and small companies, but they now saw a

Wild wells—then called gushers—were common in early days. This one was at Desdemona in 1919.

This 25,000-barrel-a-day Humble well in the West Columbia field flowed into an earthen pit, a common practice in pre-conservation days.

Key to Progress

From its earliest days, Humble has been a prolific producer of oil. Today, it ranks first in domestic production

need for merging their interests, thus strengthening their marketing position, and for branching out into other phases of the business. The result was Humble Oil & Refining Company, but the accent was placed on the word "oil."

That being the case, Humble was essentially one big production department during the early months of its existence. Not until later, through evolutionary stages, did the various other departments required for an integrated operation emerge and start functioning in their own specialized fields. And for some time, even where production was concerned, duties were not sharply defined, but Humble's top management pitched in when and where needed.

W. S. Farish, for example, seems to have been the vice president with chief responsibility for production, but several of the other directors—like Mr. Farish, men with years of field experience—also took an active part in production activities. The Company's president, Ross S. Sterling, was particularly interested in operations at Goose Creek. R. L. Blaffer was active in directing operations in North Texas. W. W. Fondren supervised the drilling of wells in both North Texas and the Gulf Coast. On the Gulf Coast, once a well had been brought in, Frank P. Sterling had general oversight of its production.

This type of organization was a far cry from that which was later to mark Humble's producing operations, but it nevertheless served the young Company well. It was highly flexible, and it left considerable room for individual initiative. It was also in keeping with the times, for there was then very little specialization in the field of production. This early period of Humble's history coincided with the heyday of the practical oil man.

Petroleum engineering was as yet an unknown profession. A 4000-foot well was considered quite deep, and very little was known about the behavior of reservoirs. Wooden derricks, more often than not much too closely spaced, dotted the deeply rutted oil fields. Croupy steam engines, their boilers often fired with wood, provided the power for drilling. Teams of horses were used to haul equipment to locations which were often a morass of mud. There was a great deal of physical waste, both above and below the

Teams of horses were used to haul heavy equipment to early-day drilling locations which were often a morass of mud. This array of horsepower is hitched to a wagon carrying a gas engine to a location in the booming Desdemona field of Central West Texas early in 1920.

ground. Wild wells—better known as gushers—were a not uncommon occurrence.

All in all, the techniques of producing oil in those days were based not so much on science and engineering as on the collective experience of a generation of practical oil men. The story is told of how the Hamill brothers, drilling the Lucas well at Spindletop, herded some cows into a soggy pit and used their churning feet to mix drilling mud. In different ways and in different situations, Humble's early production men put that same trait of oil field ingenuity to good use hundreds of times.

The old time driller is an excellent example of the type of man that characterized the oil fields of Humble's early days. The driller had to be a jack of all trades—a firm boss, a willing worker, a leader of men, a rule-of-thumb engineer, and at times even his own geologist. He was usually charged with hiring and organizing his crew of roughnecks. He had to know quite a bit about a variety of skills: steamfitting, plumbing, blacksmithing, carpentry, and stationary engineering. When emergencies arose, as they often did, it was up to him to decide what to do—and to decide it fast. And it was he who often made many of the key decisions as to the drilling of a well—when to stop and test a sand, for instance, or when to set screen.

Company Crews Drilled Wells

In most fields, up into the 1920's, Humble used its own crews to drill all its wells. (From these crews came many men who were later to hold executive positions with the Company.) Only occasionally did the Company rely on contract drilling. The rotary rig was the type of equipment generally used, but the operation of each rig was likely to be as ruggedly individualistic as the driller in charge.

Despite the absence of production practices as we know them today, Humble's output of oil showed sizable increases in every year but two (1922 and 1924) up through 1925. The Company's net production for the year 1917 was 3.2 million barrels. It produced 4.2 million barrels in 1918, 6 million in 1919, 7.8 million in 1920, 12.2 million in 1921, 11.1 million in 1922, 17 million in 1923, 15.8 million in 1924, and 18 million in 1925.

The Company's operations in such fault line fields as Mexia and Powell, as well as in such fields as Smackover in Arkansas and Haynesville in Louisiana, were particularly successful in the early 1920's, but as was usually the case in those days, flush production was almost inevitably followed by a sharp decline in output.

In 1925, for example, Humble was the second largest producer of crude oil east of the Rockies. The next year, however, the Company had a jolting experience with the feast-or-famine nature of the producing business. Its output fell off more than 4 million barrels to a net figure of 13.7 million barrels. At the same time, overproduction in the industry—production greater than effective market demand—dropped prices to below Humble's break-even point. For the year 1926, the Production Department's operations showed a loss of more than $3,000,000.

Train time at Ranger meant a seething crowd. The town of 1,000 people grew to 25,000 at the peak of the flush development in 1919.

Humble rig at Haynesville, Louisiana, in 1924 shows the type of equipment in use at the time. Note the rig has pine logs for a base.

Team of oxen stand deep in the mud which plagued operators in the Smackover, Arkansas, oil field in the early 1920s.

Wooden derricks, often too closely spaced, dotted early Texas fields. Boilers fired with wood provided steam drilling power.

These figures added to Humble's growing conviction that the old order was changing and that new producing concepts were urgently needed. The Company realized that the only solution to the problem of rising costs lay in the application of scientific principles to the production of oil. It was also beginning to realize that physical waste—including production in excess of effective demand—was a serious threat to the stability and health of the industry. If the nation was to have abundant and continuing supplies of oil in the years ahead, something had to be done about curbing this waste.

Petroleum Engineering Started

The year 1926, therefore, may be looked upon as a sort of turning point in the Company's production philosophy. On the one hand, Humble decided to add John R. Suman to its Board of Directors, his special responsibility being to improve production practices and to develop a petroleum engineering program. On the other hand, the Company began revising its views and policies relating to conservation. This was not an overnight process, but out of the thinking and study begun about this time came Humble's understanding of the nature of physical waste in the production of oil and of the importance of preventing this waste.

But before going into more detail about Humble's role in the conservation movement, let's take a look at petroleum engineering and its effect on the operations of Humble's Production Department.

Humble had had an engineering group as far back as 1920. The work of this group, however, was mainly in the fields of civil and mechanical engineering. Its activities were primarily devoted to surveying, mapping, field construction, and pipe line work. On certain production problems, such as those involving drilling muds and the treatment of crude oil emulsions, the development group at Baytown Refinery had also lent a hand. But petroleum engineering, as such, was largely an unknown quantity.

Mr. Suman joined the Company on New Year's Day, 1927. Humble's Board met that morning, and when Mr. Suman walked in, President W. S. Farish handed him a report which showed the losses the Production Department had suffered the year before.

"What's this?" Mr. Suman asked. "I thought you were supposed to make money, not lose it. Why have you lost all this money?"

"That's what you are supposed to find out," Mr. Farish told the new director.

Mr. Suman lost little time in starting to find out. His first move was to survey, field by field, the equipment and techniques then in use, thereby bringing into focus the special problems and needs of Humble's production operations. He also set out to organize a petroleum engineering department staffed with full-time petroleum engineers. By the middle of 1927, he had placed "production or gas" engineers in several of the field divisions. He also established a specialized production engineering service with headquarters in Houston, under the supervision of a chief engineer.

W. W. Scott was named chief petroleum engineer to organize and plan the work of the new engineering division under Mr. Suman's direction. In no small measure, the growth and direction of Humble's work in petroleum were established by Mr. Scott and by his successor, C. E. Reistle, Jr., who was later to become one of the Company's directors and who is now executive vice president.

The engineering group set up by Mr. Suman formed the nucleus for Humble's Petroleum Engineering Division, which was organized on June 1, 1928. Personnel for the division was recruited from among the Company's own engineers and from among recent engineering graduates of various uni-

As in most early Texas fields, close spacing of wells and hurried development, with wide-open production, were found at Mexia. This was the first important East Texas fault line field.

In the prolific Yates field in West Texas, where production shot up to 190,000 barrels a day in 1927, the operators worked out a cooperative procedure to overcome wasteful overproduction. This voluntary reduction marked the first proration of oil in a competitive Texas field.

versities. At that time, it is interesting to note, only one school in Humble's operating territory—the University of Oklahoma—offered a degree in petroleum engineering.

By the end of 1928, the Petroleum Engineering Division had 21 employees. Other young engineers were drawn from the college graduation classes of 1929, and by the end of the year the division had grown to 45 employees. The work of the division was divided that same year into five sections: electrical, gas, chemical, equipment, and petroleum engineering services.

At first, many old-timers in the oil fields looked askance at their new coworkers—the untried and untested petroleum engineers. To ease the transition from old to new production practices, and to establish a better working relationship between the practical men and the engineers, Humble started the practice in 1929 of having its new engineers serve a year or so as a roughneck or roustabout. Before sending a young engineer out to begin his stint of roughnecking, Mr. Suman would occasionally offer some sound advice:

"Forget you ever had a diploma," he would tell the young engineer. It was no substitute, he pointed out, for experience and willingness to work.

This procedure worked, and gradually the engineers and the practical men came to have a mutual respect for each other's abilities. Before too many years had passed, old-time practical men were sending their sons off to college to study engineering.

From the start, Humble's petroleum engineers proved they were well worth their salt. Their overall assignment was to improve efficiency in all the mechanical and chemical phases of producing oil—in other words, to find new ways and improve the old of keeping drilling and operating costs to a minimum. And they immediately began working toward this goal.

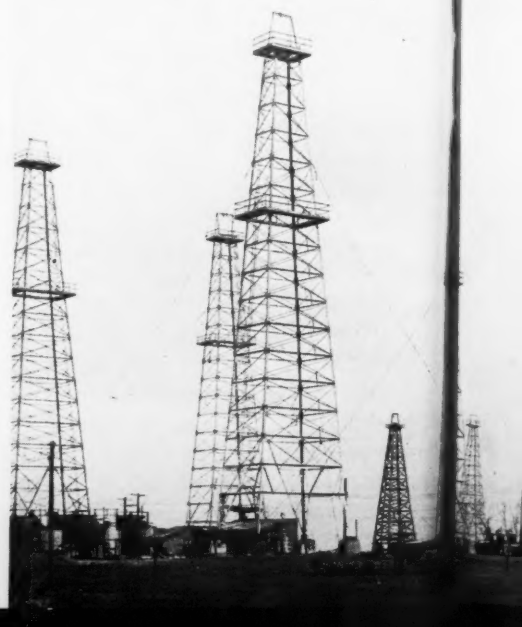
Among the many problems they attacked were those involving the testing of materials and equipment, the improvement of drilling muds, and oil well cementing. They also worked on oil treating, air and gas lift, and blowout prevention. Equipment was standardized wherever possible, and a rotary rig with interchangeable parts was designed. Steel derricks began to be substituted for those made of wood (a trend started about 1925). Gas was put to use as a source of power for rigs. Safety devices were added to make drilling less risky.

Engineers Serve on Rigs

These efforts soon spotlighted the need for greater emphasis on engineering research in the producing field, so on March 1, 1929, the Company established the Production Research Division, with Dr. H. D. Wilde in charge. Production research was not something entirely new to the Company. Ever since 1926, the development group at Baytown Refinery had rendered valuable service to the Production Department on special research projects. But now considerably more attention was paid to such problems as well spacing, unitization, and especially the function of gas in the recovcovery of oil.

Humble's production research people were to play a particularly noteworthy role in the development of the principles of reservoir engineering as we know them today. Other companies, of course, were working on reservoir problems at the same time, but Humble's researchers and engineers were probably the first to formulate the quantitative approach to reservoir analysis. They recognized that the combined effect of dissolved gas in oil, permeability, porosity, gas-oil ratios, and bottom-hole pressures could be resolved into predictions of reservoir conditions and recovery of oil.

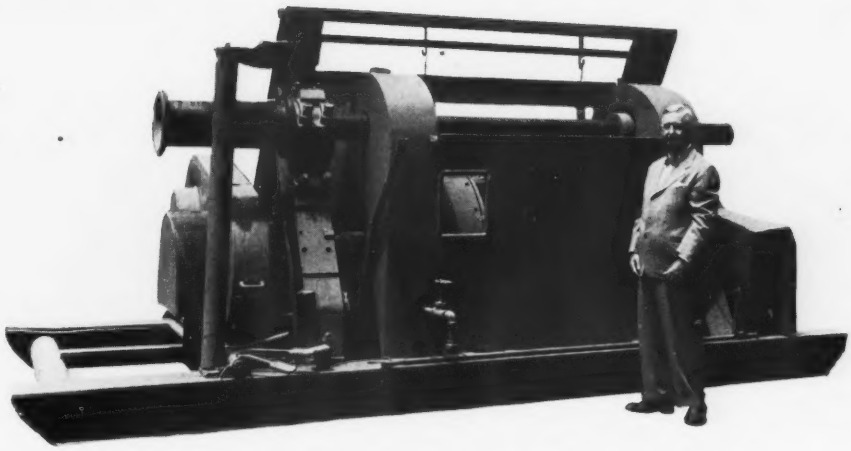
A trail in this direction had been blazed somewhat earlier by a study the Company had made of the Desdemona field. This study indicated that less than 10 per cent of the oil in the Desdemona reservoir would be recovered through traditional development and producing methods. Harry W. Ferguson collected the field data for



Steel derricks, taller and safer, by 1930 replaced wooden ones of earlier days, as is evident in this 1931 scene at Barber's Hill.

this study, while Stewart P. Coleman, then head of the development group at Baytown, was in charge of the laboratory experiments.

One answer to the problem of achieving higher oil recoveries appeared to be to return gas under pressure to the producing formations. The Company had made some experiments along these lines as early as 1926. By 1929, however, it was using air or gas injection in 16 fields. The petroleum engineer's duties in these early gas injection projects included selection of equipment, making studies of individual wells, maintenance of decline curves on the "rejuvenated leases" (as they were then called), and compilation of production data. Information gathered in the field was combined with laboratory experiments to throw more light on the scientific principles governing reservoir behavior.



First unitized drawworks, developed by design engineer Hu Harris in 1932, speeded up the moving of drilling equipment from one location to another.

Olney Project Important

Some of the Company's more important gas injection projects were at Sugarland, Olney, and Raccoon Bend. Gas injection got under way at Sugarland and Olney in 1929. It was started at Raccoon Bend in 1930.

The field at Olney has been called a "research man's dream." It was small (only 60 acres with 25 wells), and Humble had acquired the entire field. By the standards of the day, the field was considered to be nearly exhausted.

Humble completely discontinued production in the field and injected gas until the reservoir pressure was raised to near its original value. When production was finally resumed, the produced gas was again returned to the reservoir. Accurate records were kept of oil and gas production, individual well performance, and reservoir pressure. By the end of 1938, the additional oil recovery from this "exhausted" field was about 58 per cent of the amount that had been recovered prior to repressuring.

Mr. Suman called the Olney project "eloquent and incontrovertible evidence of increased ultimate recovery obtainable by the control and effective utilization of reservoir energy."

During the late 20's, Humble also gained some valuable insights into the efficiency and economies to be derived from a unitized operation. It brought in the small Boggy Creek field in East Texas in 1927, and since it controlled the entire field, it was able to develop the field in an orderly manner. It was said of Boggy Creek: "The wells are drilled carefully, brought in properly, produced sensibly, and the ultimate recovery should be much more than under ordinary operating conditions." It was here, for the first time, that Humble produced oil through tubing —a method which provided effective control over the rate of production.

A staff member of the Texas Railroad Commission called Boggy Creek the most efficiently operated pool in Texas. He reported "practically no waste oil on the ground, and nowhere on the Neches River can you find a rainbow of oil."

Just what effect was this application of technology having on the Production Department's balance sheet? The figures for 1927 and 1928 continued to show a net loss, but the following year the tide turned. Humble's production accounted for a small profit in 1929 and an even larger one in 1930.

At the same time, its output of oil took a turn for the better. Production fell off in 1927 to 13.2 million barrels, but this was only a half-million barrel drop over the previous year. In 1928, it climbed to 15.5 million barrels, and then, in 1929, it reached a new high of 23.4 million barrels. In 1930, on the eve of the East Texas boom and the big battle over conservation, it soared even higher—to 26.2 million barrels.

Much of this gain was attributable to expanded operations in the Permian Basin. In 1926, Humble's production in West Texas netted only 200,000 barrels. By 1928, it had jumped to 7 million barrels, most of it from the Hendricks field in Pecos County. In 1930, the Company brought in the first big producer at

Orderly spacing of wells, vital part of a program to eliminate waste and conserve reservoir pressure, is shown in this view of Conroe field. About 1930 industry leaders, lawmakers, government agencies, and courts combined efforts to stop wasteful development and production.

Hobbs, New Mexico. Its wells at Hobbs produced a million barrels that year.

It was during this period that Humble decided to abandon its producing operations in Oklahoma, Arkansas, and northern Louisiana. Properties in these areas were sold. The Company also withdrew from northern Mexico, which it had entered in 1919 through a subsidiary. It drilled one wildcat in Mexico—a deep test in 1929 which was dry. Not since then has Humble engaged in a foreign operation.

The years from 1931 to 1941 were among the most dramatic in Humble's production history. Not only were further great strides made in producing technology and reservoir engineering, but this decade also brought to a head a problem which had been building up for some time—that of conservation and state regulation of production.

The story of conservation is a complex one, and millions of words have been written on the subject. Many hands helped chart the course of this great movement—the petroleum industry, the lawmakers, the courts, and government agencies on both the state and federal level—so the subject has tremendous sweep. Briefly stated, however, the story on conservation is the story of a fight against the physical waste of a one-crop resource.

Old Methods Wasteful

To understand the need for conservation, one must hark back to the days when an operator drilled as many wells as he pleased on his lease and, if he could find a market, produced them wide open.

Many an operator would drill well after well along his property line and thus start draining oil from his neighbor's land. The only recourse for the neighboring owner was self-help—in other words, to drill and produce offsetting wells as fast as possible. This led to a chaotic condition wherein thousands of unnecessary wells were drilled. In the East Texas field, for example, 26,000 wells had been drilled in a five-county area by June of 1939—far more than were needed to drain even that sprawling reservoir. One half-acre tract had seven wells on it.

Excessive drilling such as this caused great economic waste. There were needless expenditures of millions of dollars, but even more serious was the fact that it frequently caused great physical waste of an irreplaceable resource. For excessive and wasteful rates of production were an almost certain aftermath of excessive drilling.

But just how can unrestricted production cause underground waste? Here are the reasons: Oil in its natural state is a completely inert fluid. It has no means of self-propulsion. It must be shoved to the well bore by some sort of pressure, and this pressure is commonly provided by the expansion of gas dissolved in the oil or by the encroachment of water or gas. If a well is produced wide open, much of this oil-moving energy may be wasted through high water-oil or high gas-oil ratios. This leaves a large amount of oil stranded in the reservoir with not enough pressure left to propel it to the well bore. Furthermore, with wide

open production, the drainage pattern is often exceedingly irregular, and a great deal of oil is thus bypassed and not recovered.

An unrestricted rate of flow also leads quite frequently to production far in excess of market demand. This causes both underground waste reflected in loss of oil recovery (by causing rapid and premature reservoir pressure decline, dissipation of gas, irregular movement of both gas and water through the reservoir—and by crippling the system of ratable takings so necessary to regular and efficient drainage and maximum oil recovery); and surface waste (through storage losses due to evaporation, leakage and fire). It also knocks some producers out of their equitable participation in the market. In other words, it destroys correlative rights.

Gradually, over the years, the experience and accumulated knowledge of the industry proved conclusively that three things must be done if physical waste in oil and gas production was to be avoided. First, the agent that displaced the oil—either gas or water—had to be conserved. Second, the pattern of displacement had to be the kind that would come closest to effectively and completely flushing the reservoir of its oil content. Third, surface storage had to be held to a minimum.

Conservation Principles

It finally became evident that the practical principles to apply to accomplish these desirable effects are: (1) avoid excessive drilling and close well spacing, which bring economic pressure for excessive and wasteful production; (2) limit the total rate of production from each field or reservoir to within the range of its efficient production rates; (3) allocate or prorate the total field production among the several properties and wells in each reservoir on a rateable basis; and (4) limit the total production from all fields to the limit of the total reasonable market demand.

All of the foregoing principles were not accepted overnight by all segments of the industry. Flush production often meant a quick pay-out, and this was hard to give up even though this same flush production might squander most of the displacing energy and render unrecoverable a large portion of the oil. The crusade for conservation, therefore, had to be drawn out over many years, but in the vanguard of this movement was Humble.

From the middle 1920's on, several of the Company's executives took an active part in the movement. Among them were Mr. Farish, Mr. Suman, Wallace Pratt, E. E. Townes, and Hines H. Baker. (For some of the legal aspects of the movement, see the article in this issue of Mr. Baker.) The Yates field in West Texas was one early example of Humble's efforts on behalf of conservation.

By late 1927, the Yates field was producing about 190,000 barrels a day and was contributing greatly to a wasteful overproduction situation. At the urging of Humble, the Yates operators appointed an advisory committee with Mr. Suman as chairman to look into the matter of establishing an efficient production program and an equitable system of proration. In September of 1927, most of the operators accepted voluntary proration of production on the basis of well potentials. This voluntary restriction on wasteful production marked the first proration of oil in a competitive field in the history of Texas.

It is unlikely that the conservation movement could have succeeded had it not been for the contributions that the industry's production and research engineers made to knowledge of the requirements for efficient development and operation of petroleum reservoirs. The scientists and engineers of Humble played an important role in this industry-wide effort. Humble was particularly interested in the study of actual reservoirs and the way they behaved under varying conditions of production. In addition to its field studies, the Company did theoretical and experimental work on reservoir behavior in its laboratories.

Among the Humble men who rendered valuable service in those early studies of reservoirs were Dr. H. D. Wilde, Stewart Coleman, T. V. Moore, T. W. Moore, Ralph Schilthuis, William Hurst, and Stuart Buckley.

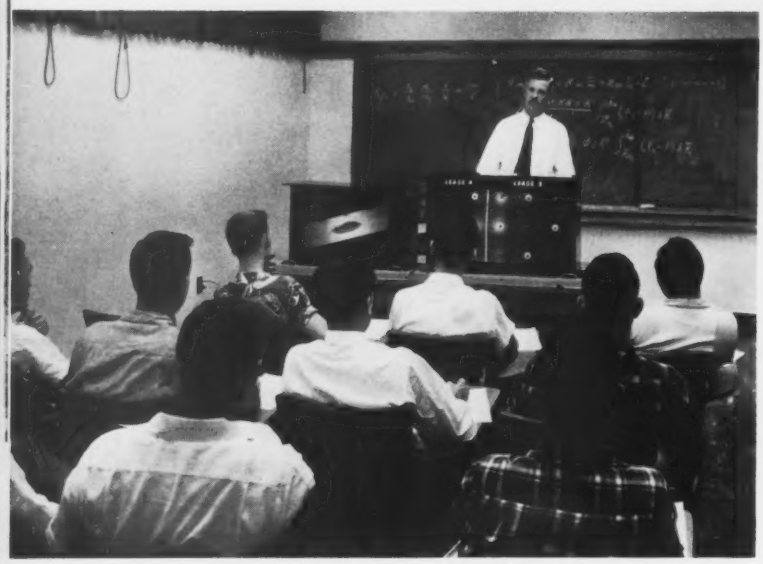
Build Instruments For Study

In order to get exact reservoir data, the Company often had to build its own instruments. In April of 1931, it built its first subsurface pressure gauge and put it to use in the East Texas field. In 1932, it developed a device which enabled it to collect reservoir fluids in the exact state under which they existed below ground. In 1933 it constructed a gas porosimeter for use in studying the porosity of producing sands. In 1937, it built its first subsurface temperature gauge.

The giant East Texas field, which was discovered in October of 1930, was both a laboratory and a proving ground for many of Humble's reservoir studies. An early example was the Company's effort to find out the type of drive predominant in the field. It was generally thought at first that East Texas was a dissolved gas field. Exhaustive studies by Humble's researchers—headed by Dr. H. D. Wilde, Ralph Schilthuis, T. V. Moore, and William Hurst—proved it was a water drive field, with much of its energy coming from the expansion of water upon reduction of pressure at the well bore.

Humble men also figured promi-

East Texas field was laboratory and proving ground for Humble researchers. Shown here is some of the early test work with Company-built equipment to determine field's predominant drive.



Reservoir engineering schools have been held in the Company for the past 13 years; several hundred engineers have received training.

Research work on equipment including miniature bit study and experimentation, has explored all factors affecting drilling rates.

nently in the industry's efforts to solve other important problems posed by this great field; for example, the problem of effecting control of the field's total rate of production to enable the natural water drive to maintain the reservoir pressure at a satisfactory level, and also to flush the maximum total ultimate yield of oil out of the producing sand.

Meanwhile, other significant changes were taking place in the Production Department. By 1931, all producing operations had been unified and the department placed under one general manager—David Frame. (Mr. Suman continued to have the overall responsibility as Director in charge of Production.) In 1931, the department took over the operation of the Company's casinghead gas plants, and in 1935 it organized a subsidiary gas department under John O. Sue.

The petroleum engineering group, which had the responsibility for drilling tools and equipment and improving production practices, also continued its progress. This group was headed in the 1930's by W. W. Scott. In 1936, C. E. Reistle, Jr., joined the Company as engineer in charge of the Houston petroleum engineering staff, and in 1940, after the death of Mr. Scott, Mr. Reistle became head of the petroleum engineering staff.

With the application of engineering principles to field work, and with increased emphasis on training, Humble's drilling crews steadily improved their efficiency. Of some crews it was said that they could rig up blindfolded, so well did each man know his job. In 1933, the story goes, Mr. Suman went over to Tomball to watch a Humble crew bring in the Company's first well in that field. Just before the crucial moment came, the driller walked over and sat down in a car.

"Aren't you going to be on the derrick floor when they bring the well in?" Mr. Suman asked the driller.

"I don't need to," the driller replied. "Those boys know exactly what to do and when."

Other highlights of this dramatic decade included the development of the unitized rig (a simplified, three-part rig which could be taken down, moved, and set up again in 24 hours); the use of new drilling muds to help control heaving shales; the advent of submersible barges for underwater drilling; and the introduction of directional drilling. The latter technique, which was developed by a West Coast oil man, was first put to use by Humble in 1933 to kill off a spectacular wild well in the Conroe field.

It was also during this period that Humble became a large producer of natural gas. In earlier years, Humble

Simulating actual reservoir conditions in laboratory models enabled researchers to develop information on reservoir behavior.

had sold most of its gas discoveries since there was very little demand for gas at the time and practically no outlet to markets. In the early 30's, however, the Company made a number of sizeable gas discoveries, and most of them were within 40 miles of Houston. The Company began negotiating for industrial sales, and these sales were the genesis of the Tomball gas system.

From 1936 to 1941, Humble's gas sales increased by about two-thirds. The Company also stepped up its construction of casinghead gas plants—a reflection of both the increased demand for lighter hydrocarbons (such as butane and propane) and the need under a program of conservation to stop wasteful flaring of gas. In this five-year period, the amount of gas processed by Humble went up four times over the previous five years, while its output of liquid gas products increased three times.

Submersible barge rigs, perfected by the industry in the 30s, made possible development of major reserves in shallow inland waters and coastal marshes along the entire Gulf Coast.

Cycling Plant Started

In fields with reserves of distillate, cycling was another important development. This entailed extracting natural gasoline and other products from the rich gas and then returning the dry gas to the reservoir. In 1941, Humble and other producers in the Katy field agreed to an efficient unitized operation, and plans were started for construction of a large cycling plant at Katy to obtain maximum liquid recovery from the gas and at the same time conserve the dry gas for future use.

The upward trend in Humble's oil production continued during the period from 1930 to 1941. In 1930, for example, the Company produced 26.2 million barrels of oil. In 1941, its output was 56.5 million barrels. Its producing wells increased from 1714 to 7758, and of the latter number, 71 per cent were flowing wells.

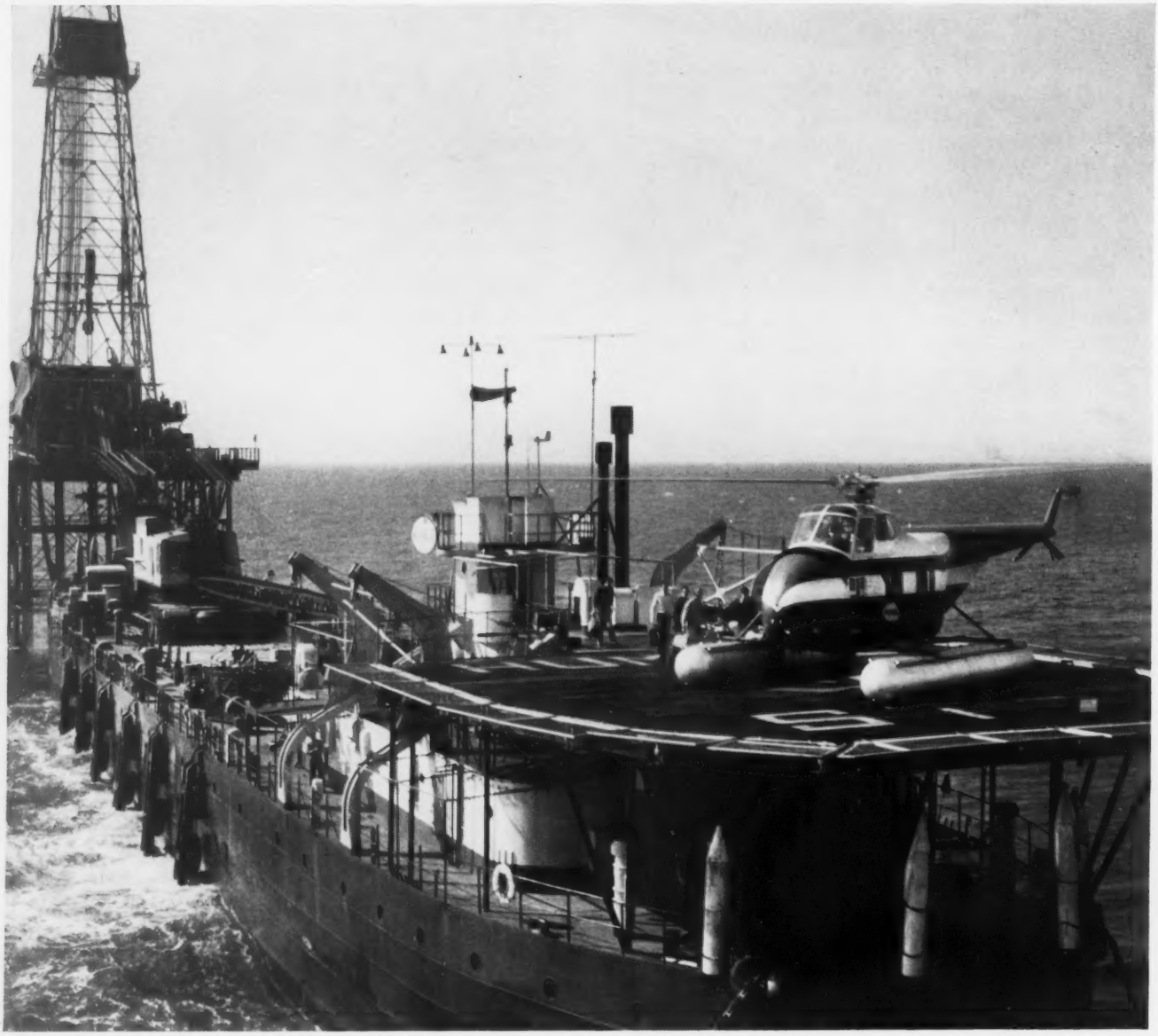
In December of 1941 came Pearl Harbor, and America's petroleum industry found itself almost overnight faced with a tremendous challenge to its productivity. Humble was in an excellent position to do its part in meeting this challenge. During the previous decade, it had increased its oil reserves about 13 fold, compared to about 50 per cent for Texas and the rest of the country. With the large reserve producing capacity which it had built up and maintained during the trying 30's, Humble was able to more than double its production during the war years.

In 1942, the first full year of the war, Humble produced 58 million barrels of oil. In 1945, its production was 116.3 million barrels. In the latter year, the Company supplied one barrel out of every 20 produced throughout the world.

One of the most dramatic examples of the Company's increased production was at Friendswood. In 1941, the Friendswood field was producing about 18,000 barrels a day. By March of 1945, the field was producing more than 60,000 barrels a day—and without exceeding the maximum efficient rate of production! Percentagewise, the Hawkins field did even better. It went from 2000 barrels a day in 1941 to more than 28,000 barrels a day in 1945.

Output of light liquid hydrocarbons, some of which were important ingredients of 100-octane aviation gasoline, was also greatly increased. In 1941, the Company produced 1.7 million barrels of these liquid hydrocarbons. In 1945, it produced 4.9 million barrels.

Katy Gas Plant, a joint cycling operation, was started in 1941 to obtain maximum liquid recovery from gas and conserve dry gas for future use. Original plant has been greatly expanded.



Offshore operations in the Gulf of Mexico are among the Company's most important post-war efforts. Original self-contained platforms have given way to smaller platforms served by drilling tenders. Helicopters are used to transport crewmen to and from locations.

The Katy Cycling Plant, which was opened on January 1, 1943, accounted for much of this increase. Katy was a model of advanced conservation practices. Only 14 wells were used to produce this large field, while four other wells were used for returning the residue gas after the liquids had been extracted. In January, 1945, Katy reached its wartime record output of 13,000 barrels a day. Nearly half of this was 91-octane gasoline.

Because of the shortage of steel and of manpower, Humble's drilling declined during the war. During the two years of 1943-44, it drilled only an average of 318 wells a year, which was less than half as many wells as it had drilled during the previous three years. However, the Company did increase its proportion of wildcat wells. In 1939-41, only 5.76 per cent of its wells were wildcats. In 1942-45, 17 per cent of its wells were wildcats.

Although research and production engineering had to be cut back during the war, Humble did carry on with its reservoir research. In 1944, the Company held its first reservoir engineering school for Company production engineers. This school offered a three-month course in such subjects as formation evaluation, reservoir mechanics, the various types of drives, and secondary recovery—all directed to maximizing oil recovery and efficiency in development and producing operations. In recent years, several hundred of the Company's engineers have attended this school.

In 1944, Humble brought in its first producing well in Mississippi. The following year, it drilled its first wildcat well on the King Ranch.

The postwar years have seen a continuation of Humble's growth and progress in production operations. In 1946, for example, the Company had a net output of 117.8 million barrels of oil. In 1956, its production was 148.4 million barrels. During the same

period, Humble increased its number of producing wells from 8721 to 13,145.

One of the most significant developments during these years has been the move into the offshore areas of Louisiana and Texas. Humble had conducted some experiments with offshore drilling in the late 1930's, but not until August 15, 1948, did it bring in its first offshore well. The site was near Grand Isle, Louisiana. In November, it brought in a second producer at Caminada Pass, about 10 miles southeast of Grand Isle. These two wells were the most expensive to drill in Humble's history, the first costing $785,000 and the second $848,000. Both were drilled from permanent platforms in about 50 feet of water.

Since the war, Humble has also become active for the first time in several other areas—Alabama, California, Arizona, and, just recently, in Alaska.

Research Pays Dividends

The Company's production and engineering research have also shown great progress. In 1946, for example, a research project was set up to make a detailed study of all factors affecting drilling rates, and the results of this study have proved highly important. In 1946, a thorough analysis was made of the manpower requirements on certain types of drilling rigs—an investigation which is believed to be the first study of its kind made in the drilling industry.

Other research projects in recent years have dealt with such matters as eliminating sand production from wells, improvement of casing perforators, development of better cements and drilling muds, and so on. By 1953, the Company had developed a wireline well workover process (permanent type well completion) which is now licensed to service companies for industry-wide use.

One phase of the Company's production activities that has expanded greatly since 1950 has been that of field-wide unitization of reservoirs. Because of the bearing that engineering analyses have on unit operations, much of the early unitization work was done entirely by reservoir engineers. The volume of unitization work expanded so rapidly, however, that a permanent unitization organization was set up within the Company.

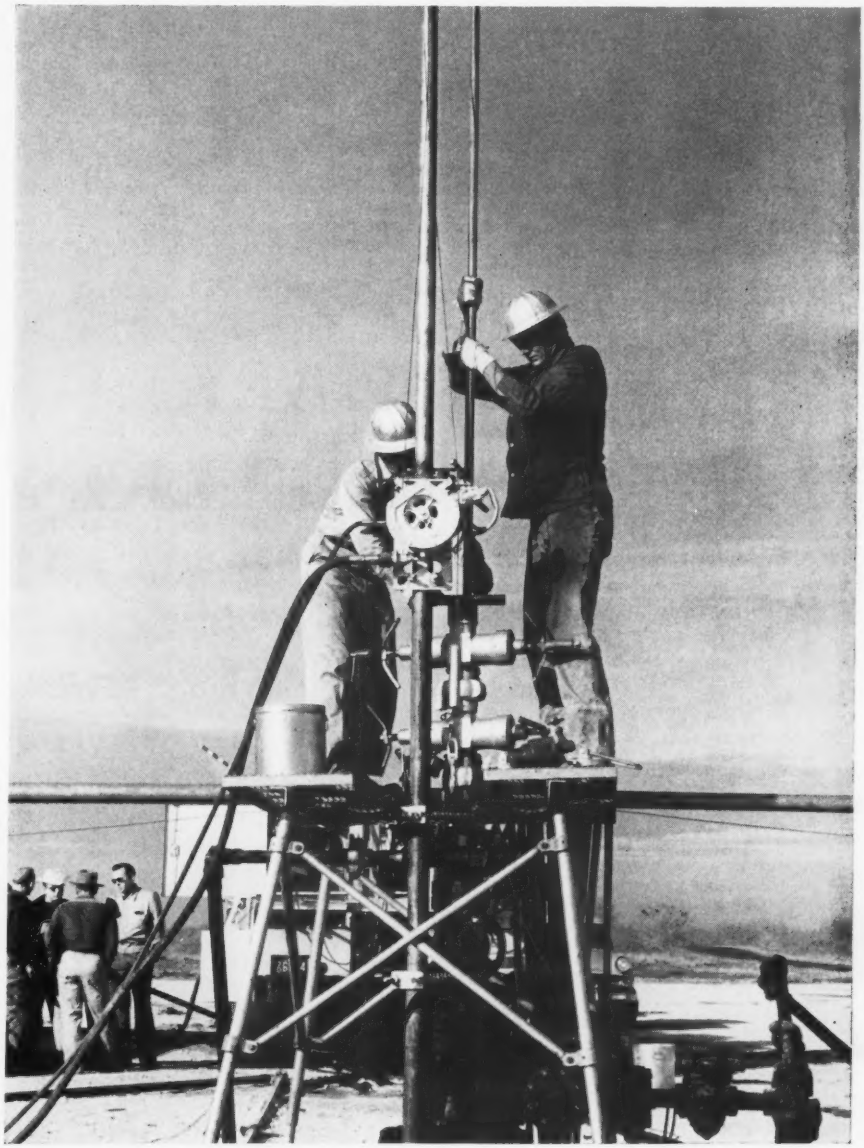
The story of Humble's production—a story of growth—is still being written. Each year brings a new chapter, and the Company is looking forward to more of the same solid achievements which have characterized its first 40 years and the great progress of the petroleum industry as a whole.

Not too long ago, a veteran of Humble's early-day operations looked back over the years and tried to pinpoint the reasons for the Company's success. He recalled the days when Humble was getting its start—a time when the mortality rate in what was then a feast-or-famine industry was exceedingly high. Yet the young company, he noted, not only weathered the vicissitudes of dry holes and up-and-down prices, but it also managed to build soundly and strongly for the future.

"I don't know exactly what it took to be successful," this Humble veteran finally confessed. "I suppose a company with an honest crowd running it, whose judgment was good and who had luck in striking oil, could be successful."

It was Humble's good fortune to have all these factors working in its behalf. But it was also its good fortune to have some of America's most capable production men—on the rig, in the field, and in office and laboratory—backing up its efforts.

These men, in the final analysis, have been the key to the Company's production, its growth, and its success.



Wire line workover process (permanent type well completion) developed by Humble engineers and licensed to service companies, is one of several major contributions of production engineers.

First pump station, tank farm, and dock operated by newly organized Humble Oil & Refining Company was in the Goose Creek field. This and a few miles of gathering line were part of properties combined in 1917. Humble Pipe Line Company was organized in 1919.

TO MARKET WITH FIVE BILLION BARRELS

Humble Pipe Line Company started in 1919 with less than 50 miles of line; today it is one of the nation's leading transporters of crude oil

HUMBLE Pipe Line Company was organized in 1919. At that time, oil production was increasing to keep up with rising demands that followed World War I. During the transition from horses to horsepower, refineries began to turn their attention from kerosene to gasoline. More than ever before, the mounting pressure of demand for motor fuel encouraged and hastened the growth of pipe lines.

Humble began its pipe line operations by acquiring a small gathering system known as the Southern Pipe Line Company. This system boasted less than 50 miles of four-inch and smaller pipe in the Goose Creek and Burkburnett oil fields, but it was destined to grow into one of the largest crude oil pipe line systems in the country.

Expansion came quickly. In 1920, Humble began to build an 8-inch line from the Ranger area, in North Central Texas, to Webster and Texas City, on the Gulf Coast. A lateral connection drew oil into this line from the West Columbia field. With this program were linked Humble's plans for a major refinery at Baytown and a crude oil shipping terminal at Texas City.

From its modest beginning, Humble's pipe line system had grown in 1920 to 433 miles of trunk lines and 245 miles of gathering lines. At the end of the year, the Company's lines served four oil field areas—Ranger, Hull, West Columbia, and Goose Creek. An average of 35,000 barrels of oil per day moved through the system in 1920.

The decade from 1920 to 1930 marked the period of Humble Pipe Line Company's greatest expansion. In those ten years, more than 5,600 miles

In the old days, coating the line with layer of hot protective dope was entirely a manual operation. Holding it up for the doping was another job calling for "elbow grease."

of trunk lines and gathering lines were built as the Company extended its facilities well throughout Texas and into New Mexico. In this expansion, a large area was covered with the main line system, making it possible in later years to serve economically many new oil fields which grew up near trunk line arteries.

The first pipe line built by Humble into the West Texas area was laid in 1925. Meanwhile, an increase in production from that area and from Southwest Texas made necessary further expansion and enlargement of loading facilities. A new line was laid from West Texas to Ingleside, on the Gulf Coast—and in the fall of 1928 the Company began operating its Harbor Island loading terminal near Corpus Christi.

During the decade between 1930 and 1940, the system was extended to serve a number of new and very productive fields.

Historically, the 1930's included the discovery and development of the great East Texas Field and the consequent formation and adoption of conservation and proration laws in Texas. Administration of these laws set a new

Tent cities provided housing that could be moved to keep up with pipe line. crews building Kemper-to-Ingleside line during expanding mid-20s period.

Large numbers of men used hand methods to lay much of the main system in early years. Note windlass at right, used for lowering pipe into the ditch.

Suction and discharge manifolds being installed at Harbor Island, on Gulf Coast. This facility gave Humble another deepwater crude oil loading port.

Equipment and methods changed over the years, but pipelining remains rugged. Here is a rock-strewn crossing of the Pedernales River, in Texas Hill Country.

pattern of field development affecting pipeliners as well as producers.

In 1936, Humble began operating a pipe line between East Texas and Baytown handling liquefied petroleum gas. A 300-mile, 8-inch crude oil line with a 16,000 barrel per day capacity from London station was converted for this purpose. It was the first long line for this class of service to be placed in operation.

The period from 1940 to the present brought heavy demands in volume of oil products handled. First, oil for war swelled the volume; then came the post-war era of increasing public demand. Although the 1,700 miles of line laid from 1940 to 1953 increased the Company's mileage by only one-fourth, the daily volume of oil gathered and transported practically doubled.

A major project in 1950 was the construction of an 18-inch line spanning the 370 miles between Kemper Station in West Texas and Satsuma Station near Houston.

Completed early in 1957 was an 18-inch pipe line spanning 94 miles between Ector Station, north of Odessa, and Kemper Station, near Big Lake. At Kemper, this line (through which can move in excess of 100,000 barrels of crude oil a day) feeds an 18-inch line to the Gulf Coast and Baytown Refinery, as well as the Company's 10 and 12-inch system to Harbor Island.

Crude Oil System

Humble's crude oil system serves 668 oil fields, more than 6,000 leases, and 27,000 wells. There are more than 5,700 miles of trunk lines and 3,500 miles of gathering lines in the system. The trunk lines or main arteries extend into practically all important producing areas of the state.

This crude oil pipe line system includes more than 600 storage tanks with capacities ranging from 5,000 to 150,000 barrels each. Just to fill up the pipe in the system takes about three million barrels of oil, and storage tanks will hold nearly 24 million barrels more. This amount about equals all of the allowable petroleum production of Texas for nine days.

Trunk line pump stations number 115, ranging in horsepower from 40 to 4,000. Types of pumps in use include reciprocating, rotary, and centrifugal.

(Continued on Page 41)

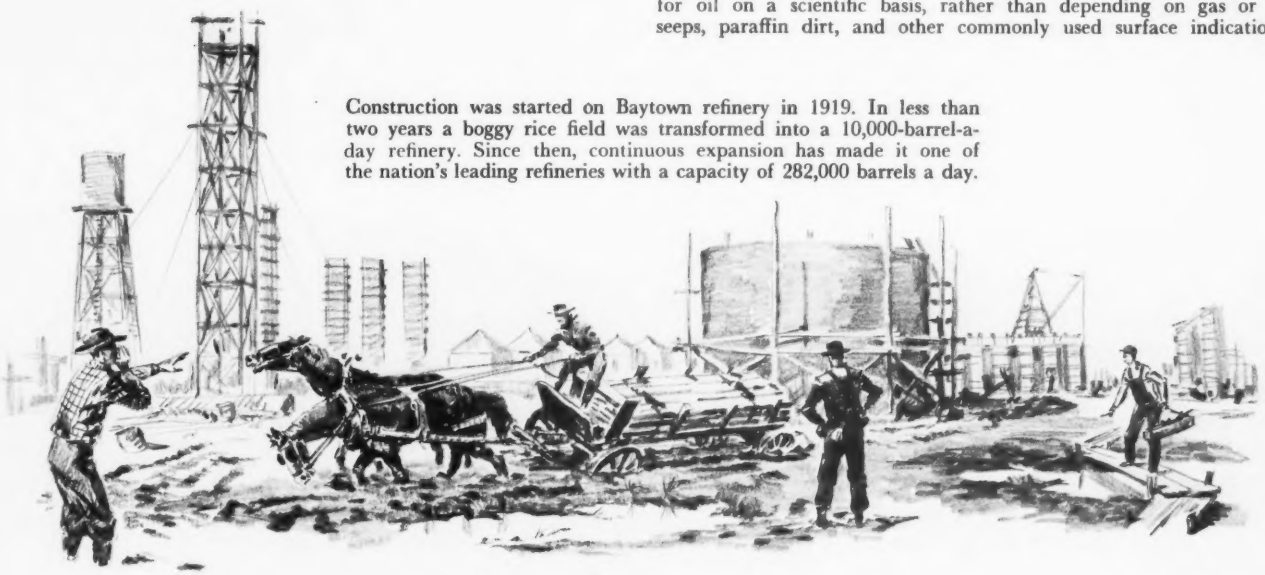
Progress Sketch Book

Illustrated highlights which mark the pathway of Humble's development over the past 40 years

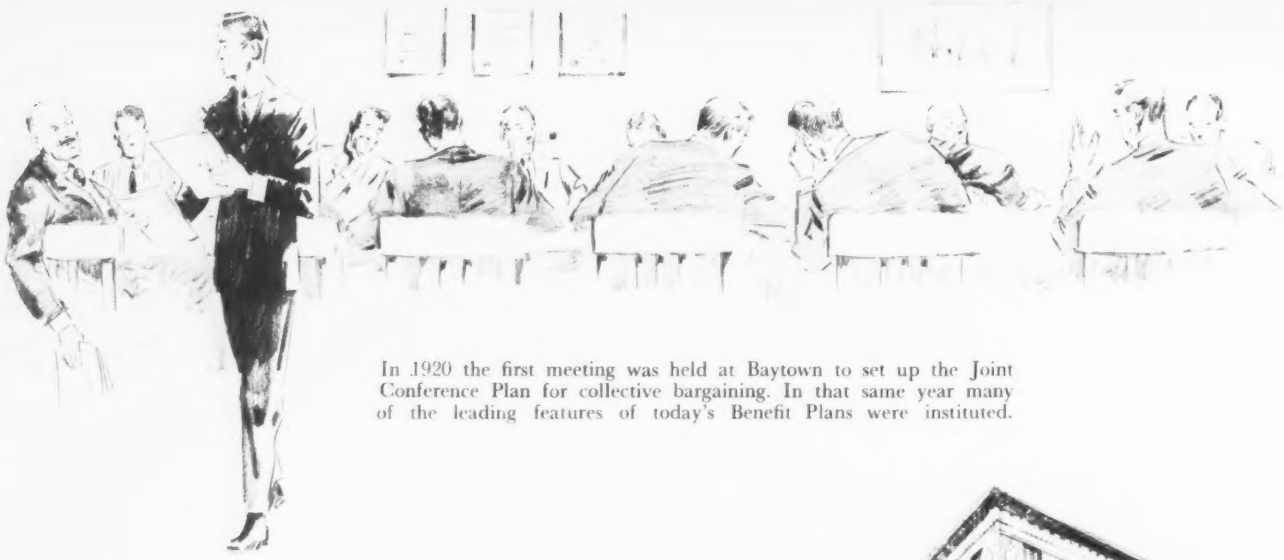
Gasoline from the Company's first small refinery at Humble, Texas, was delivered in a Model T tank truck and was sold at sidewalk-pump "filling" stations in downtown Houston in 1917.

In March 1918, Humble hired its first geologist and began the search for oil on a scientific basis, rather than depending on gas or oil seeps, paraffin dirt, and other commonly used surface indications.

Construction was started on Baytown refinery in 1919. In less than two years a boggy rice field was transformed into a 10,000-barrel-a-day refinery. Since then, continuous expansion has made it one of the nation's leading refineries with a capacity of 282,000 barrels a day.

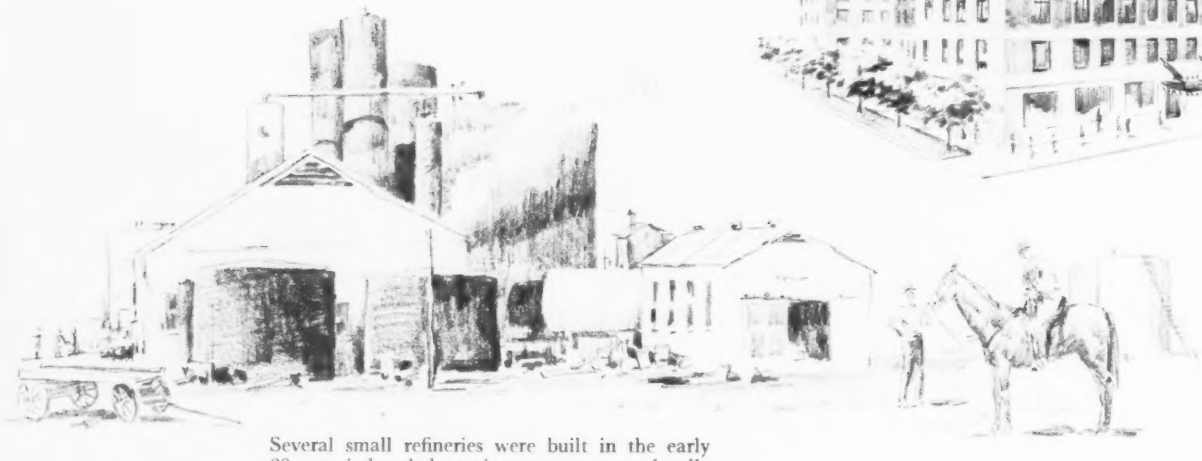


In 1919 Humble employed its first medical Doctor, establishing the policy of medical care for employees. Today the Medical Division employs 43 doctors, nurses, technicians, and administrative people to guard employee health.



In 1920 the first meeting was held at Baytown to set up the Joint Conference Plan for collective bargaining. In that same year many of the leading features of today's Benefit Plans were instituted.

In 1921 the nine story Humble Building was completed at the corner of Main and Polk Streets, and the growing young company moved into it from smaller rented quarters in the Goggan Building.

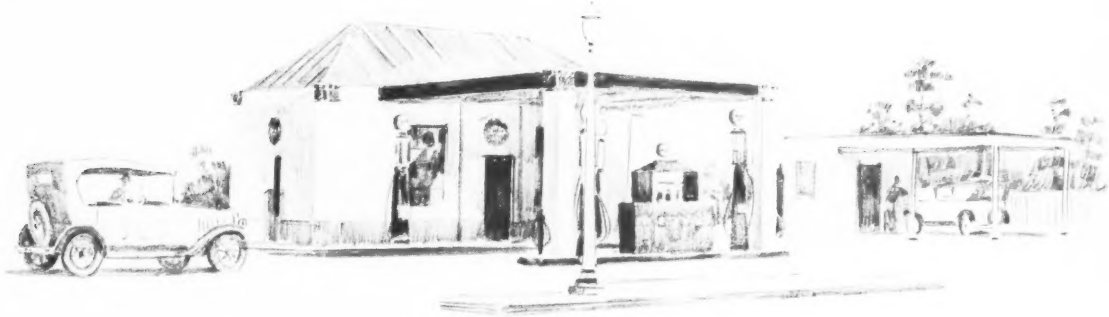


Several small refineries were built in the early 20s at inland locations to process locally produced crude oil and to serve area markets.

Much of Humble Pipe Line Company's early system was built by hand methods, but ditching and pipe laying equipment came into use in the 20s, the period during which major expansion of the system took place.

In 1924 Humble began using geophysics to explore for oil. A research and equipment development group was set up and a shop was established in Houston. First seismometer and photo recorder were placed in use in April 1925.

Block leasing, as contrasted with the then popular "checkerboard" plan, was adopted in 1927. Block leasing soon resulted in a trend to develop oil pools as units rather than by frantic competitive drilling by multiple operators.



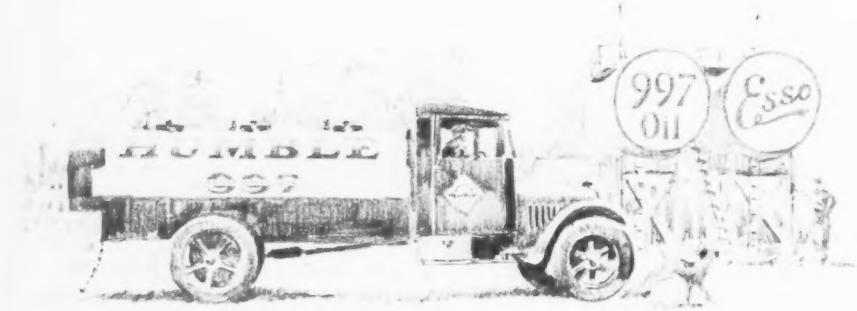
From 1927 to 1931 Humble built more than 200 service stations to launch an aggressive retail marketing program.

In the Sugarland field, developed in 1928-29, Humble introduced 20-acre spacing and controlled development.

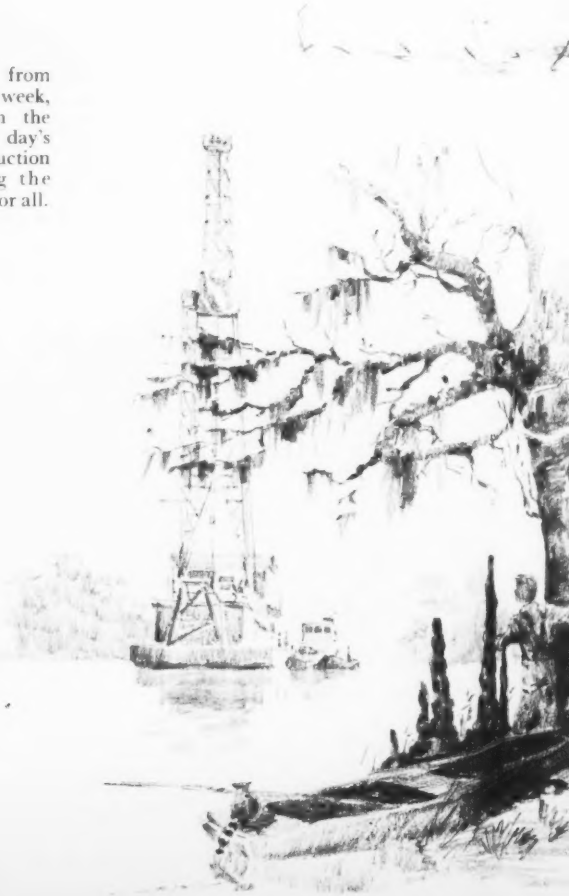
Humble Pipe Line Company established an outlet for increasing production in West Texas by laying a 347-mile 10- and 12-inch line in 1927 from Kemper to tidewater at Harbor Island, Humble's second major crude oil shipping point.

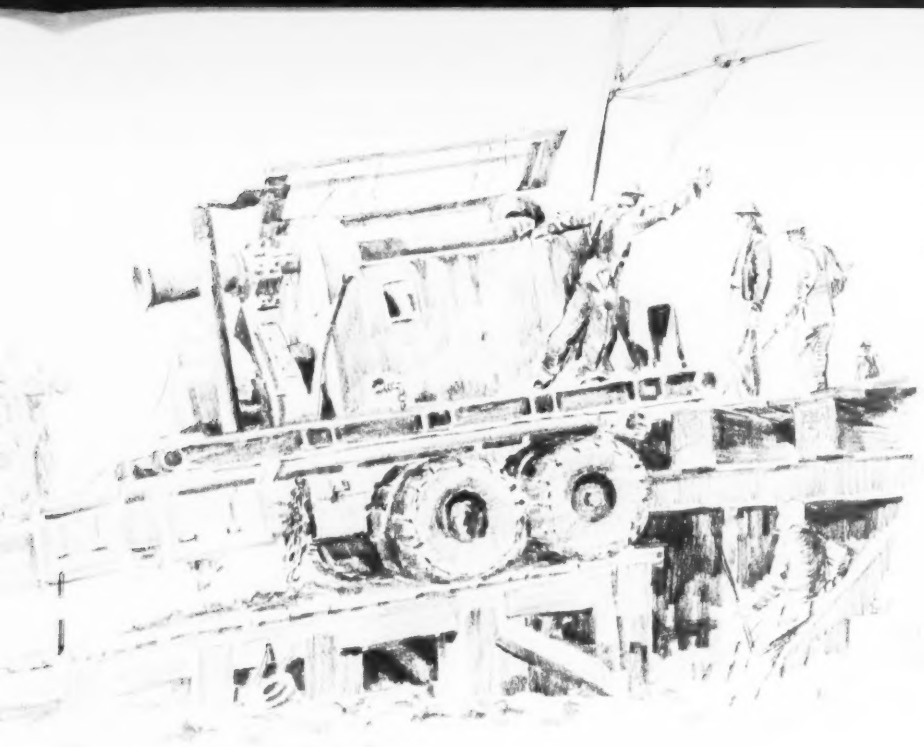
An organized Company-wide safety program, a training employees in accident prevention was st 1929. That same year the Industrial Relations ment was organized, combining such separate fun annuities and benefits, safety, medical, and pe

In 1928 Humble changed from the 10-hour day seven-day week, common in field work in the Texas oil industry, to "one day's rest each week without reduction in earnings." Before long the eight hour day was adopted for all.



Esso Gasoline and 997 Motor Oil were introduced to Texas motorists in 1931, and played important roles in gaining public acceptance for Humble products.





Movement of drilling equipment from one well site to another was greatly simplified by Humble's development in 1932 of the first unitized drawworks.

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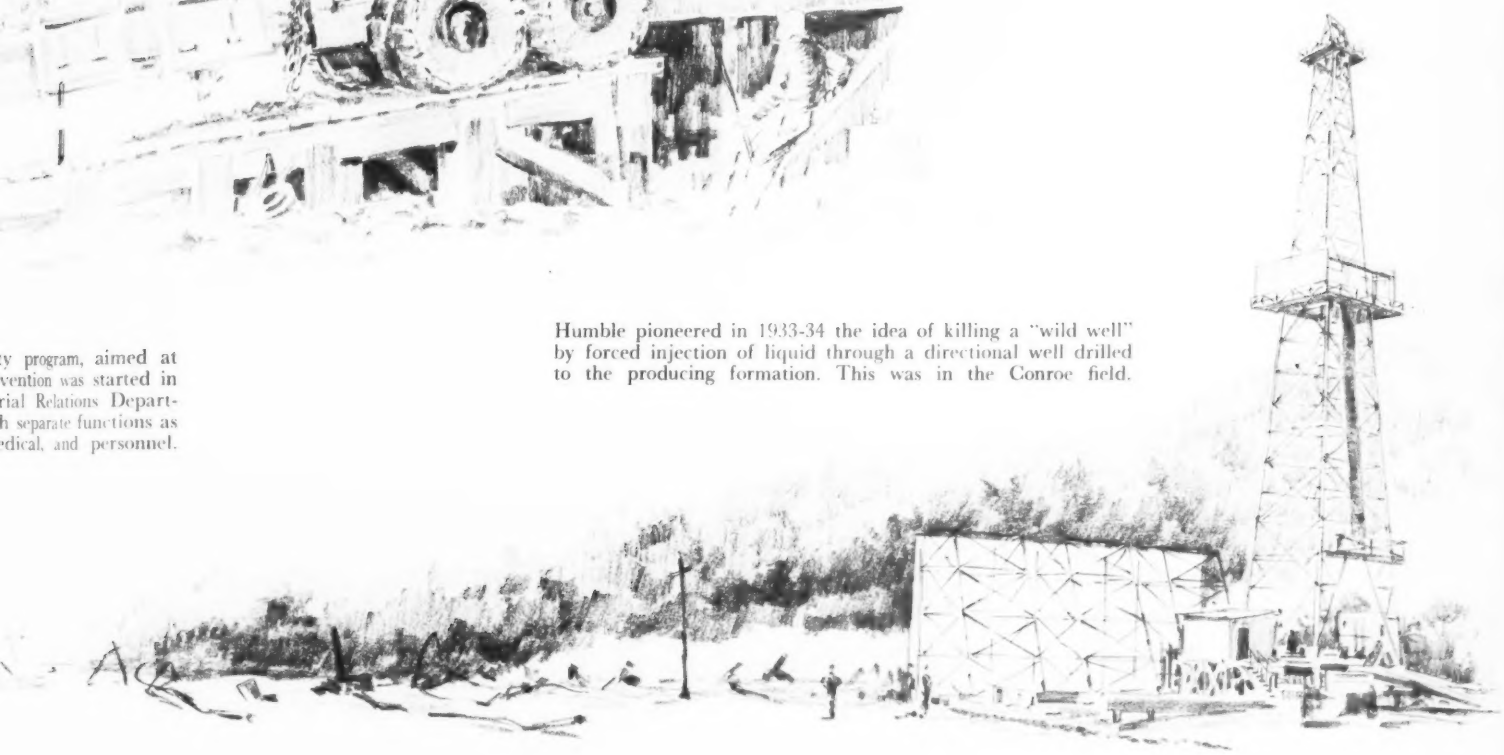
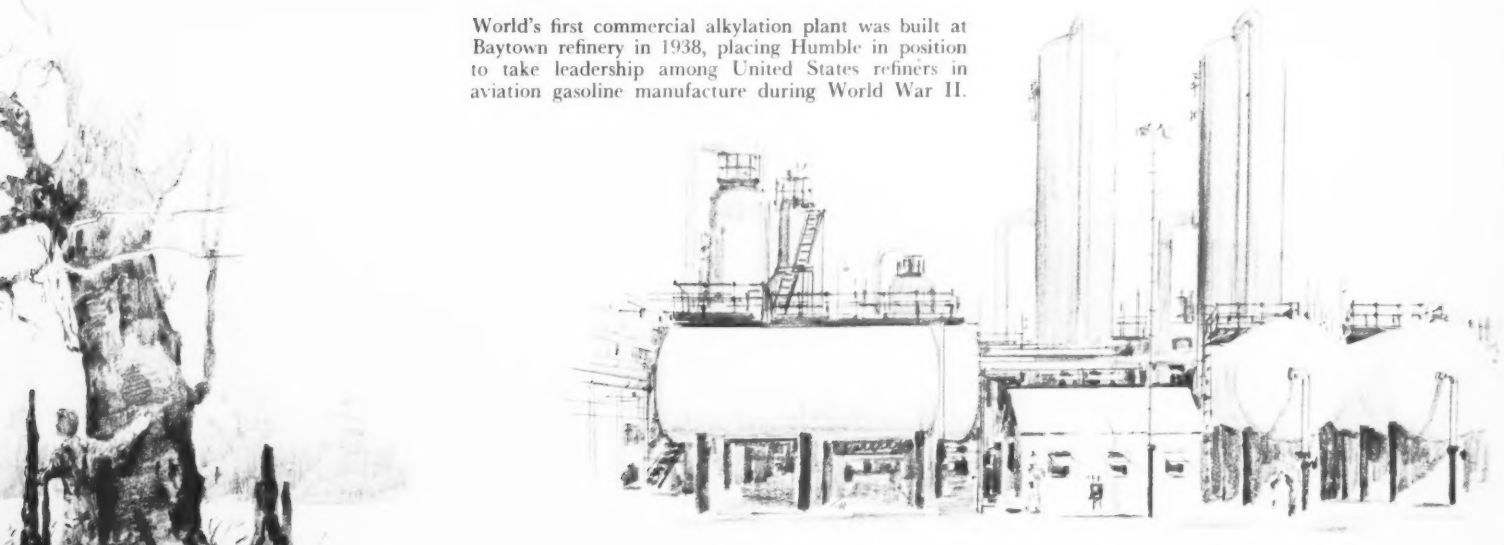
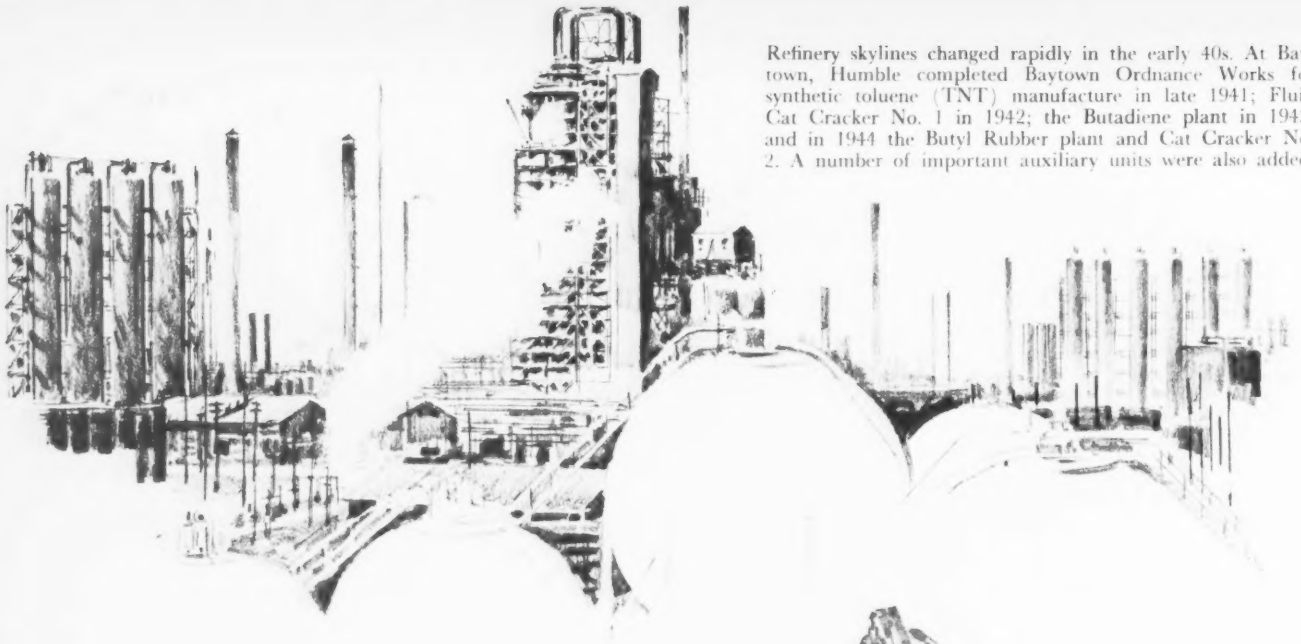


Humble pioneered in 1933-34 the idea of killing a "wild well" by forced injection of liquid through a directional well drilled to the producing formation. This was in the Conroe field.

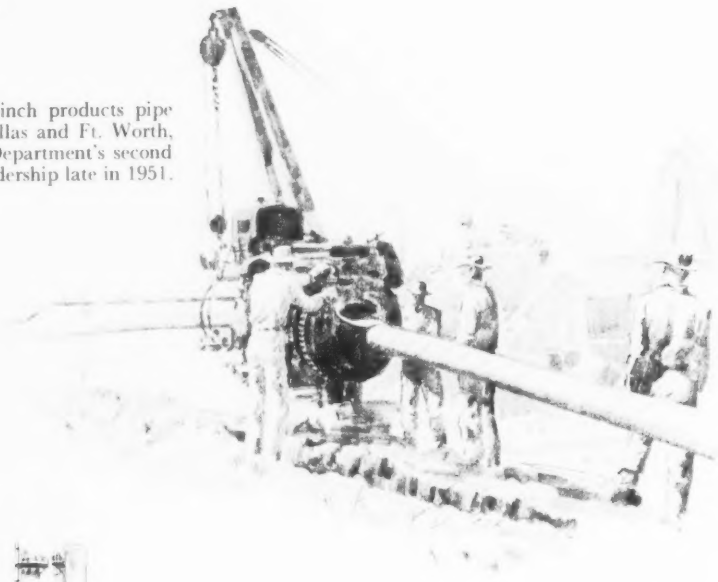


World's first commercial alkylation plant was built at Baytown refinery in 1938, placing Humble in position to take leadership among United States refiners in aviation gasoline manufacture during World War II.

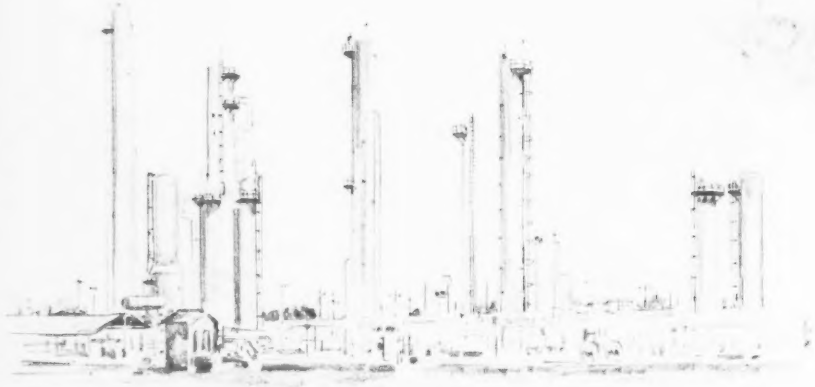
The submersible barge rig, developed by others during the late 30s, enabled Humble and the industry to develop major oil reserves in the shallow bays and inlets of Texas and in the coastal marshes of Louisiana.



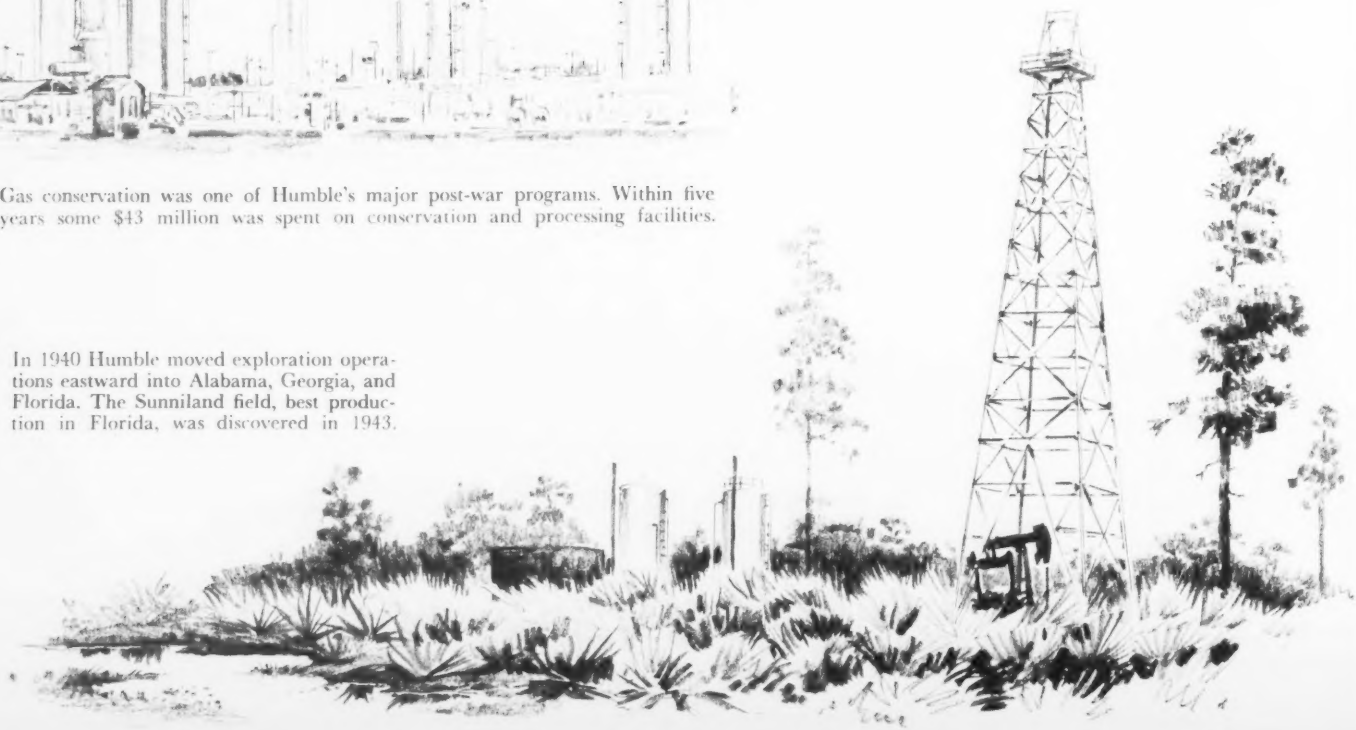
Refinery skylines changed rapidly in the early 40s. At Baytown, Humble completed Baytown Ordnance Works for synthetic toluene (TNT) manufacture in late 1941; Fluid Cat Cracker No. 1 in 1942; the Butadiene plant in 1943; and in 1944 the Butyl Rubber plant and Cat Cracker No. 2. A number of important auxiliary units were also added.



Humble Pipe Line Company built an 8-inch products pipe line from Baytown to Irving, between Dallas and Ft. Worth, in 1946. This gave impetus to the Sales Department's second major expansion move and led to sales leadership late in 1951.

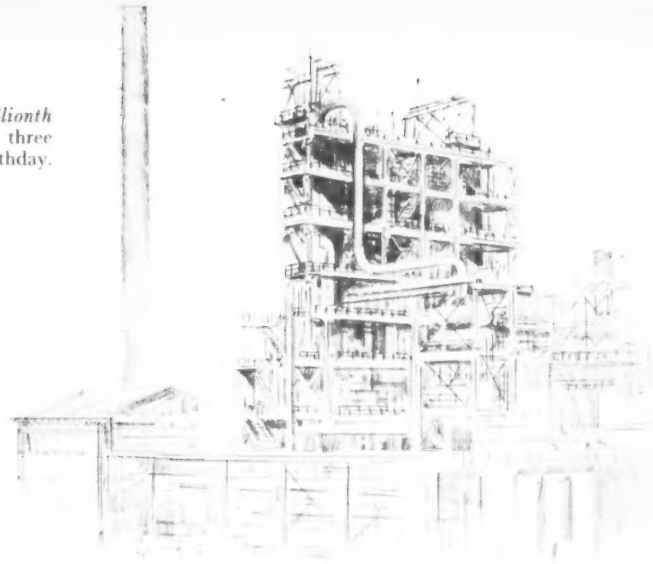


Gas conservation was one of Humble's major post-war programs. Within five years some $43 million was spent on conservation and processing facilities.

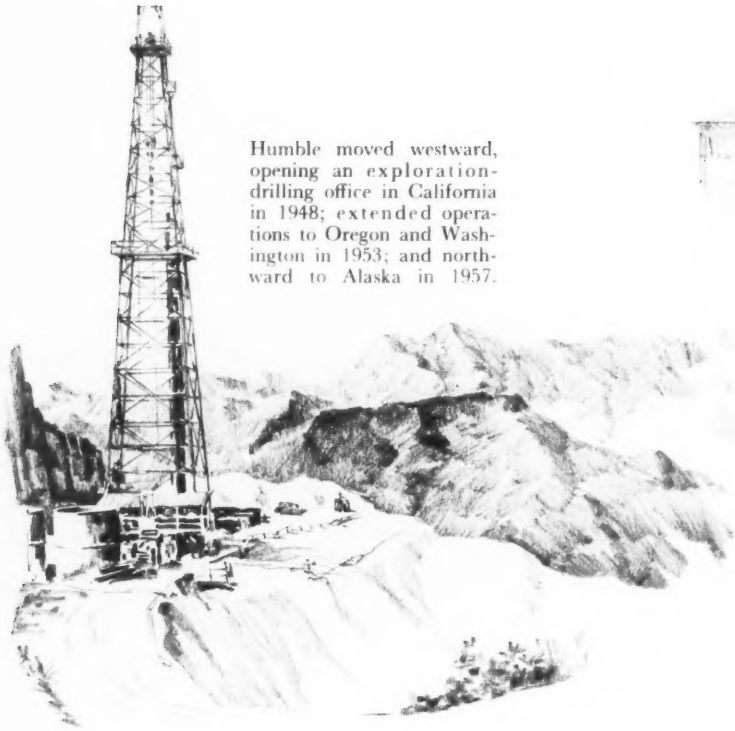


In 1940 Humble moved exploration operations eastward into Alabama, Georgia, and Florida. The Sunniland field, best production in Florida, was discovered in 1943.

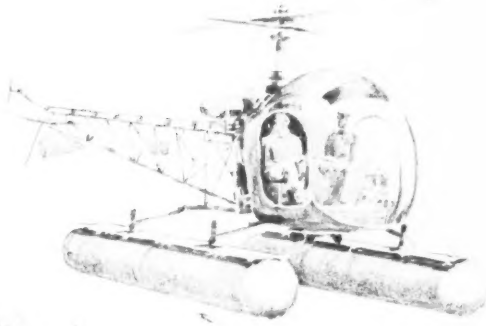
Baytown refinery processed its *billionth* barrel of crude oil on May 8, 1947, three days before the plant's 27th birthday.



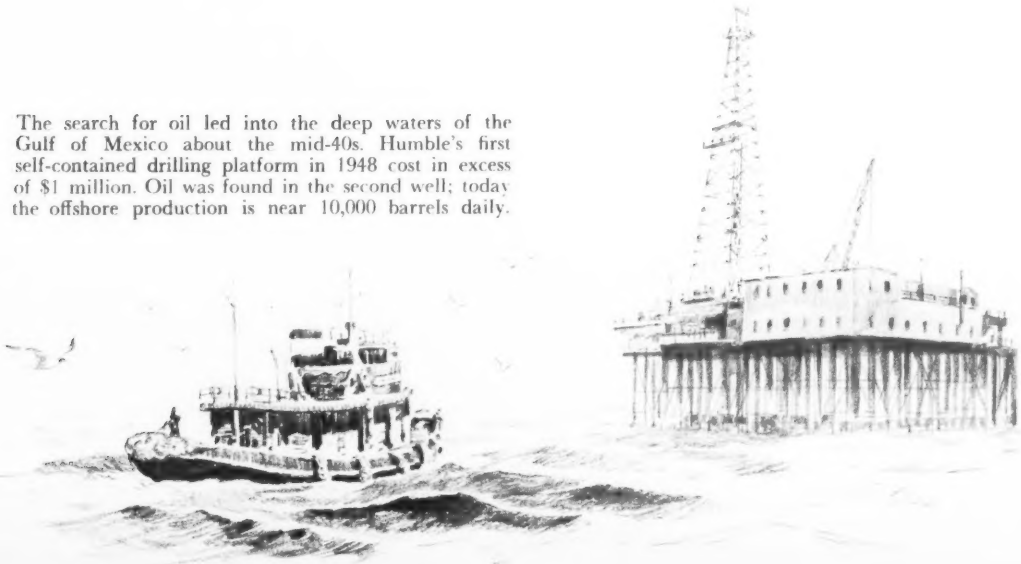
Humble moved westward, opening an exploration-drilling office in California in 1948; extended operations to Oregon and Washington in 1953; and northward to Alaska in 1957.



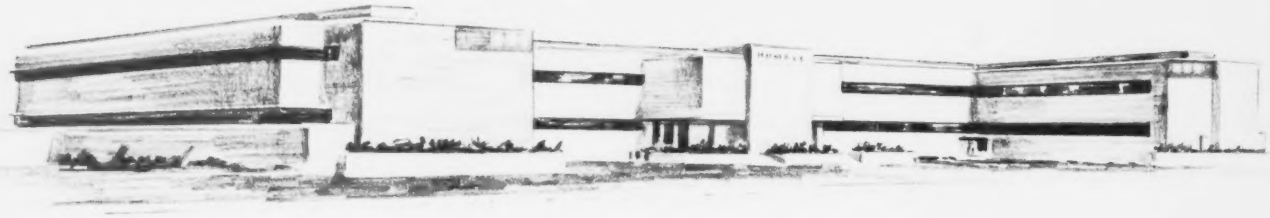
Helicopters were first used in 1951 to expedite gravity meter operations in the marshes of Louisiana.



The search for oil led into the deep waters of the Gulf of Mexico about the mid-40s. Humble's first self-contained drilling platform in 1948 cost in excess of $1 million. Oil was found in the second well; today the offshore production is near 10,000 barrels daily.

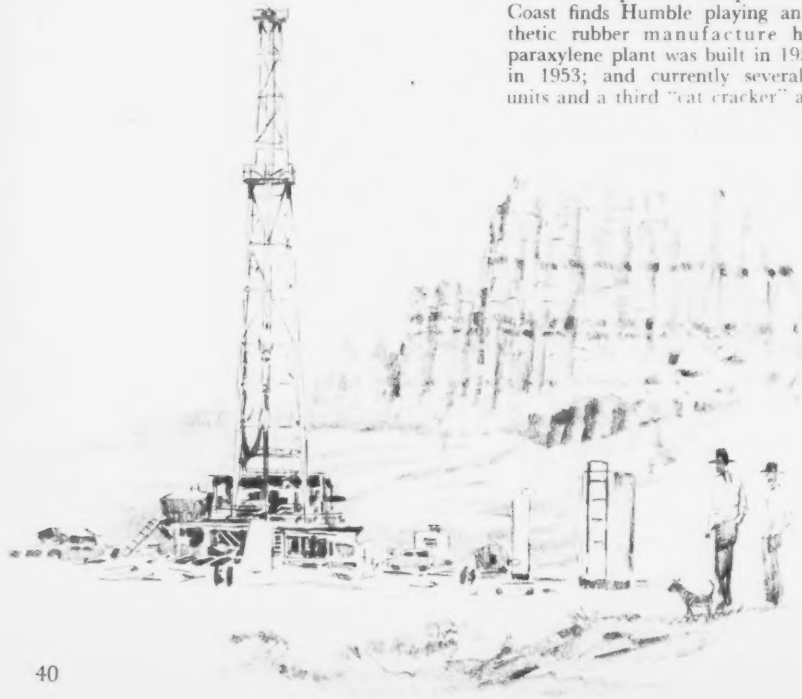


Increasing emphasis on research brought on the need for expanded facilities in the early 50s. A new research building was completed at Baytown in 1952; the Houston Research Center was occupied in 1953. Additions are being built to both this year.



Product quality, station cleanliness, and good service continued to attract customers to Humble stations, and late in 1951 Humble became the No. 1 gasoline marketer in Texas. Expansion in North and West Texas, New Mexico followed.

Post-war expansion in petrochemicals on the Gulf Coast finds Humble playing an important role. Synthetic rubber manufacture has been increased; a paraxylene plant was built in 1952; a cyclohexane unit in 1953; and currently several large petrochemical units and a third "cat cracker" are under construction.



The first commercial oil well in Arizona was brought in by Humble late in 1955 in the rugged, scenic Four Corners area.

(Continued from Page 32)

With the exception of its 20-inch, 40-mile trunk line from Satsuma to Baytown, the Company's Kemper-Satsuma 18-inch, 370-mile line out of West Texas is the largest trunk line in the system. This line is equipped with a combination diesel and electrical initial station, and three electric centrifugal booster stations of modern design which provide a maximum capacity of 135,000 barrels of crude oil per day.

Another important part of the crude oil system is the Company's dock terminal at Harbor Island. Here are located loading docks for two super tankers and a dock for barges.

Harbor Island is one of the fastest loading crude oil terminals in the Western Hemisphere. It can handle vessels up to 720 feet long, loading at the rate of 30,000 barrels per hour at one dock and 40,000 barrels per hour at both docks simultaneously.

In providing the service of gathering oil, the Company extends its lines to the lease tank batteries owned by the producers. When the tanks are filled by the producer and the oil has been tested and accepted, it enters the gathering system and is delivered to a designated point on the trunk line normally termed the "railhead."

Humble Pipe Line Company handles more than 80 different grades of crude oil and mixtures, and where required these various grades are handled with a minimum of commingling or mixing when batched through the pipe lines.

Between 1919 and 1957 Humble Pipe Line Company delivered more than five billion barrels of crude oil.

It should be pointed out, here, that Humble Pipe Line Company is a common carrier, and its operations are subject to control by the Interstate Commerce Commission. Tariff rates are subject to regulation by state and federal regulatory bodies. Its pipe lines carry oil for others in addition to Humble Oil & Refining Company.

Flying the lines to check for breaks and leaks, which appear below as discolored areas, in mid-forties replaced older method of walking the lines.

Products Lines

Fully as important as the pipe lines that gather and transport the crude oil to refineries and tidewater terminals are the lines which move the refined products to the consumer. Actually, more care is required in product pipe lining since, barrel for barrel, finished products are much more valuable than crude oil.

Humble Pipe Line operates a refined products line between the Houston and Dallas-Fort Worth market areas. The line originates at Baytown Refinery and terminates at Irving, Texas.

The products line operates continuously. Several grades of finished motor fuel, aviation gasoline, and jet fuel move through the line.

Continued Progress

From the first, the Company has kept pace with new developments in materials, equipment, and techniques in pipe line operations. It made use of electricity as early as 1921 for pumping oil where this type of power was economical. The Company began welding its pipe lines as early as the middle 1920's. It was one of the first

Electronic tank gauging is easier, safer, and faster than old methods of climbing tank and gauging contents manually. Many tanks can be gauged from central location.

WHAT PIPE LINES MEAN TO CONSUMERS

CRUDE oil, moving from the far end of Humble Pipe Line Company's gathering system in West Texas to Humble's Baytown Refinery on the Gulf Coast, travels about 500 crow miles. But it costs the owner only half a cent a gallon to have it moved that distance.

A one-way railroad ticket for that amount of oil would cost ten times that much. To transport it by truck would be equally expensive.

There's something significant in this little comparison for the average citizen. It is: consumer costs must of necessity include cost of moving the product to market. When you buy a Washington State apple, or a Maine frozen lobster, a portion of the price is the item's fare to you. It's likewise true when you buy a gallon of gasoline for your automobile—although the fuel probably is Texas-produced.

Fortunately for the millions of Americans who drive automobiles and use oil and gas products in other forms, the petroleum industry has perfected an efficient, low-cost method of getting their goods to you: through pipe lines. But for pipe lines, all land-carried oil *would* be moved by rail or truck. And that would hit you where it hurts the most—in your checkbook, for it would send your gasoline bills soaring.

Pipe lines, then, have performed a great public service since the first successful one was completed in Pennsylvania shortly after the Civil War. Since then, the story of pipe line progress is a saga of operational techniques, the development of safety devices and procedures, and the improvement of mechanical and engineering equipment—all aimed at the dual targets of increasing volume and reducing costs.

to study corrosion and make use of modern practices to reduce costly metal loss.

The Company is using all-welded tanks instead of the old-type riveted storage tanks. It installed automatic controls and devices for ease and safety of operation. In recent years, it has provided automatic remote reading tank gauges at many stations and tank farms. Airplanes patrol its many miles of lines, searching for leaks, washouts and other surface conditions. These and other features mark Humble Pipe Line Company as a modern, progressive organization determined to improve its service.

A vital part of the operational facilities is the communications system. This service has expanded along with other major developments of the Company. The system began with the telephone and telegraph and now includes teletype, F-M, and microwave radio, which permits uninterrupted operations in even the worst weather conditions.

Like others in the oil industry, people in the pipe line business must keep an eye cocked constantly toward newer and better ways of doing things. Humble must think always of the transportation of petroleum and its products in relation to changing economic conditions. A continuing modernizing process is necessary to maintain its competitive position in this field.

People and Progress

The spirit and driving force of any organization comes from its people—and Humble Pipe Line Company is no exception.

The 2,000 employees of the Company represent a wide variety of trades and professions. Along with a whole spectrum of engineers are stenographers, clerks, accountants, airplane pilots, electricians, mechanics, pumpers, gaugers, superintendents, and others.

Compact electric motors drive centrifugal pumps set on concrete slab in foreground at Webster Station. These six move as much oil as did larger pumps of another type in the big pump station. From here, 13 grades of crude oil are distributed to shipping and refining points.

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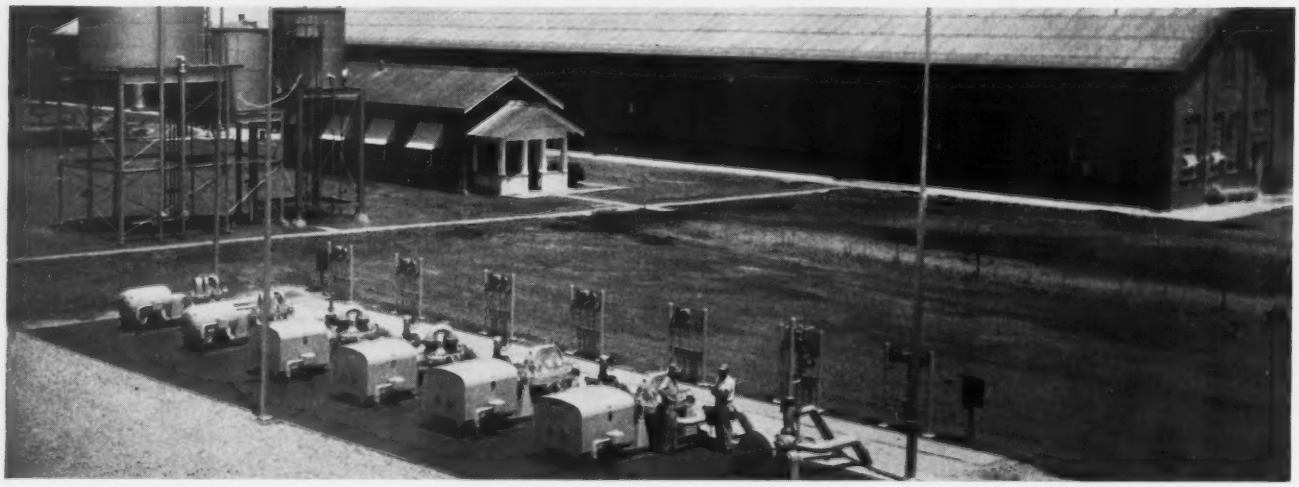

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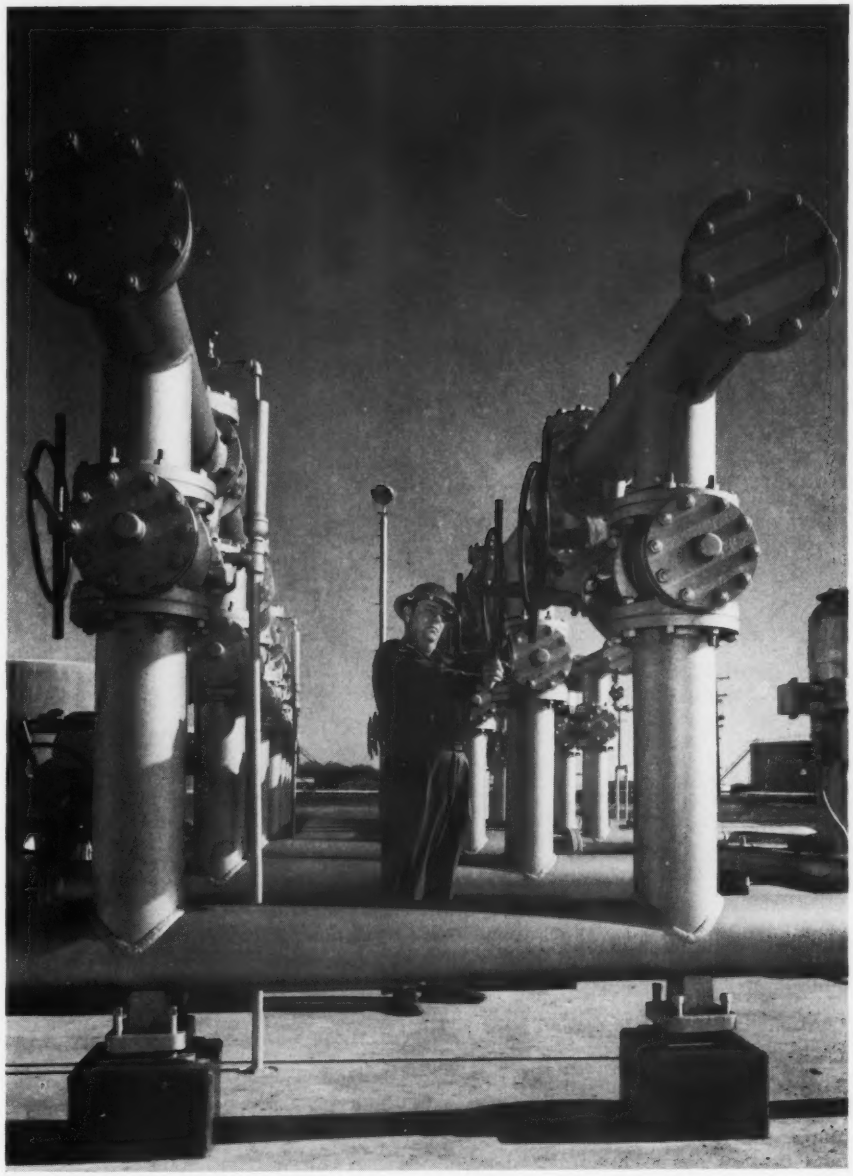


Turn of a valve sends average of 24,000 barrels daily of gasoline and other products from Baytown Refinery to North Texas and to distributing terminals along the pipe line.

Their geographic realm is as far-flung across Texas as is their range of activities. Some 238 of those employees are at home in the Houston Office and the remainder in the Company's five operating Divisions—nearly 375 in Southwest Texas, 360 in East Texas, 300 in North Texas, 370 in West Texas, and 445 in the Southern Division.

Humble Pipe Line executives are able to apply a wealth of experience and business know-how to their duties. They are men who have worked their way up through the ranks in their respective fields, and average more than 29 years' service with the Company.

Top management consists of a six-member Board of Directors including a president, vice president, controller, secretary-treasurer, general superintendent, and counsel. It is this Board's responsibility to plan for and guide the entire organization in carrying out its basic purpose of transporting petroleum and its products safely, surely, and efficiently.

That Humble Pipe Line *does* move oil safely is reflected in numerous employee safety awards and records which indicate high morale and an excellent attitude of mutual consideration for one another in the performance of their daily work.

Humble Pipe Line Company employees are offered opportunities to improve their chances for advancement. A leadership training plan includes an executive development program and a divisional employee training program. Because of the loyalty and excellent employee cooperation in these and other training programs, definite advancement in the growth and development of personnel is taking place to the benefit of both the Company and the employee.

This cooperative spirit of Humble Pipe Line's people goes beyond any particular program, however, into all aspects of the organization's activities. It has enabled the employee to contribute mightily to the welfare of himself, his Company, and the community in which he lives.

HUMBLE PIPE LINE COMPANY AT A GLANCE

Date Organized	1919
Gathering Lines, miles	3,500
Trunk Lines, miles	5,700
Total Texas Mileage	9,200
Oil Fields Served	668
Leases Served	6,000
Trunk Line Pump Stations	115
Employees	2,000
1956 Payroll	$13,500,000
Average Daily Crude Delivery, 1956, barrels	675,600
Average Daily Products Delivery, 1956, barrels	24,000
Barrels of Products Delivered: 1946 through 1956	66,500,000
Barrels of Crude Delivered: 1919 through 1956	5,180,000,000

At Harbor Island, a freighter churns through the channel while two tankers take on cargo at the Humble docks through some of the world's fastest loading equipment. Tank farm in the background holds West Texas and Southwest Texas grades of crude oil awaiting shipment.

DAILY SALES...HALF MILLION BARRELS

In 1919, Humble bought oil from only four fields in Texas; today, Crude Oil Department buys from more than 500 fields

VOLUME of crude oil bought and sold by Humble during its early years was naturally small. The Company's own production in 1917 was less than 9,000 barrels a day; the state's total had not yet reached 100,000 barrels daily. But major discoveries like Burkburnett, West Columbia, Ranger, and Mexia in the next few years made large oil supplies available, and Humble began purchasing oil for resale.

By 1922, when the Crude Oil Department was organized, daily crude oil purchases had grown to an average of 49,000 barrels. As continually more oil became available during the 20's, both from the Company's own wells and from purchases, Humble sought aggressively to develop greater markets.

Evidence of the success of these efforts lies in the figures for 1956: Humble's daily average production, 371,000 barrels; average daily purchase of crude oil from others, 433,000 barrels. The total of more than 800,000 barrels a day is approximately 25 per cent of the total daily production in Texas. After supplying from this large volume the needs of about 260,000 barrels daily for Baytown Refinery, Humble had available for sale some 540,000 barrels a day of crude oil.

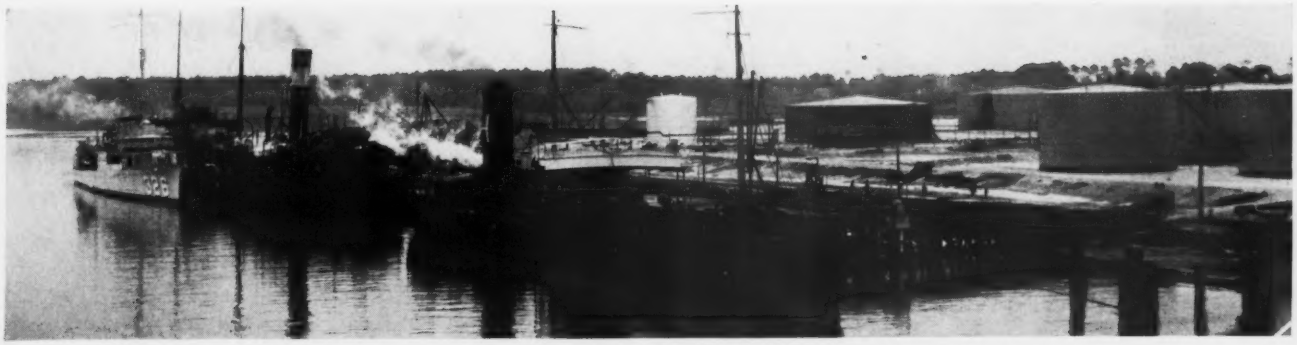
While this crude oil marketing program was being developed over the years, a natural necessity was the parallel development of storage, dock, and loading facilities to handle the large volume. Originally Humble built docks and terminal storage for loading crude oil aboard tankers at Texas City. These facilities were used until they were destroyed by the Texas City explosion and fire in April, 1947. A new installation was then constructed at Baytown, including ample storage and docks for two ocean-going tankers.

Harbor Island facilities, near Corpus Christi, were developed at the same time (1927) that the Pipe Line Company built a line from West Texas to that point on the Coast. At Harbor Island some of the world's fastest loading equipment can service two tankers and several barges simultaneously.

The first posting of crude oil prices by Humble was in a bulletin issued in October, 1919. Since then Humble has sought always to post prices that are fair to the producer and to the refiner who ultimately buys the oil. Believing that posted prices represent a true value of various grades of crude oil, Humble has consistently followed a practice of not paying "premium" prices for oil and not selling at "discounted" or lower prices than posted.

Through the years Humble has followed a policy, in fields in which it is a purchaser of crude oil, of taking rateably from leases of all producers, thereby limiting its own production to a proportional part of its total requirements for the market it supplies.

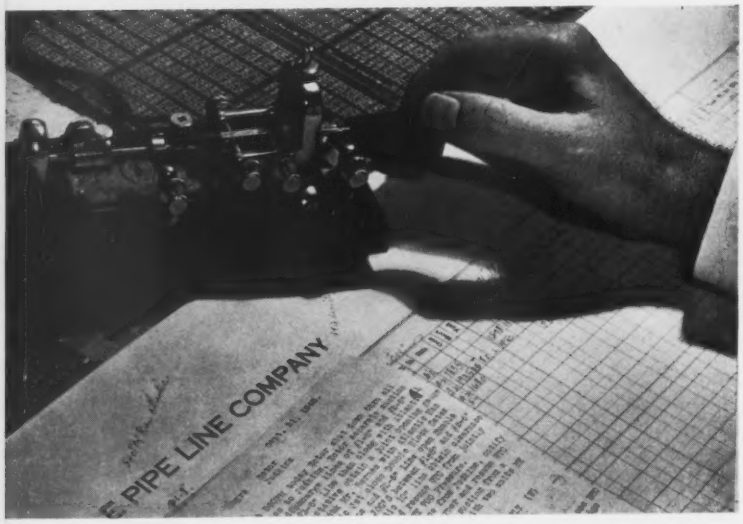
In 1919 Humble was buying crude oil in the Goose Creek, West Columbia, Burkburnett, and Ranger Fields. Today, Humble buys oil from more than 500 fields in Texas.



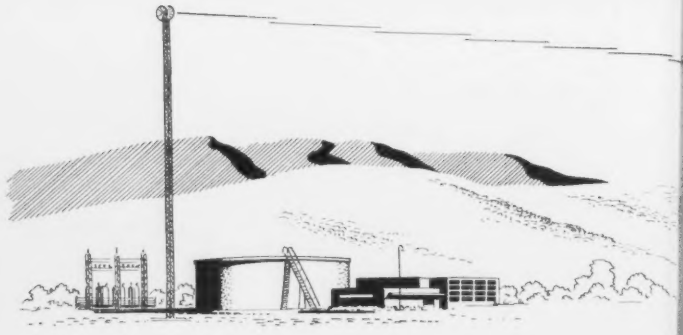
Tankers which called at Humble's Baytown docks in 1922 were smaller than today's giants which take upward of 200,000 barrels. Loading in the foreground is the *Baytown,* the first and only tanker owned by Humble for a brief period during the early development years.

Largest crude oil tank farm operated by Humble is this one at Webster, between Houston and Galveston. Its storage capacity is 2,675,000 barrels. From here 13 grades of crude are dispatched to refineries in the coastal area or to Baytown for loading aboard tankers.

Dock space and storage capacity were increased at Baytown in 1947. Present facilities can accommodate six large tankers—for refined product and crude oil loading—and several barges. A large part of the average daily sales of 500,000 barrels of crude moves through Baytown.



Morse Code hand telegraphy was one of the first communications mediums utilized by Humble Pipe Line Company to help transport oil.



MORSE CODE TO MICROWAVE

Rapid, accurate communications continue to play timely and significant role in Humble's pipe line progress

MOVEMENT of crude oil through Humble's pipe lines over the years has depended directly on accurate, up-to-the-minute communications.

Field pumpers have to know when and what to pump into the lines; dispatchers have to know when to start and divert batches of crude of various grades into storage tanks. Like underground railroads, pipe lines must operate on a precise timetable if the right oil is to wind up in the right place at the right time.

The communications network designed to help meet these needs had its beginning in 1919. In that year, construction crews and six-mule wagons piled high with poles slogged through axle-deep mud in the South Texas countryside to string the Company's first telephone and telegraph lines. These wires extended out of Houston and paralleled Humble's newly-built pipe lines from West Columbia to Webster and Texas City, and from Comyn to Webster Station.

No sooner were these first lines humming with business, however, than other crews moved out to build circuits connecting Houston with still newer oil fields and pipe lines. In a short time, phone operators and telegraphers in the Houston Office were sending and receiving messages from oil fields at Goose Creek and West Columbia on the Gulf Coast, to Cisco and the North Texas area.

Each new mile of pipe laid during the expansion of the 20's saw a corresponding increase in the communications system serving it. By 1930, the Company owned and operated more than 2,000 miles of telephone and telegraph lines throughout Texas.

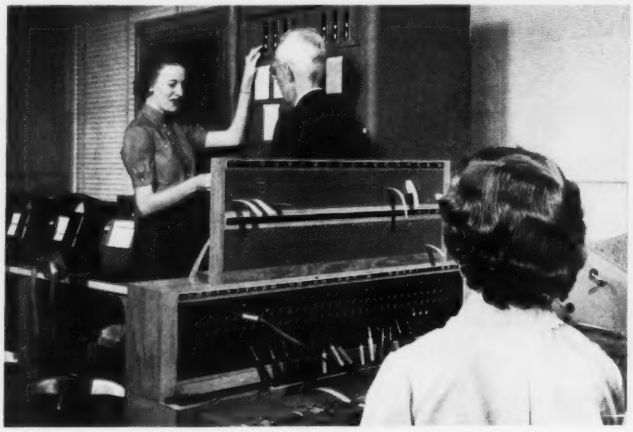
A new era in Humble's expanding communications network came in 1936 when a newly-invented machine—the teleprinter or teletypewriter—clacked into service. A typist sitting in the old Communications & Electrical Department office on the sixth floor of the Humble Building in Houston clattered out the Company's first teletype message on a line to Baytown Refinery. Shortly thereafter, another line went into operation between Houston and Humble's Ingleside Refinery. With the introduction of these remote-controlled machines, hand telegraphers and Morse Code transmission began a steady decline in importance until 1956, when the last hand telegraph key made its exit from Company service.

Modern microwave system provides several telephone voice channels and teletypewriter service interconnected to existing wire facilities.

Humble's pipe line communications took another major step forward in 1952 when Company engineers began operating a new 400-mile microwave radio relay system between Kemper Station and Houston. The decision to link the new 18-inch pipe line via microwave radio instead of wire stemmed from the West Texas weather. High winds, pole-snapping ice storms, and howling blizzards had played havoc with wire communications in that area; the microwave system provided a weather-proof operation.

At present, the microwave network includes two terminal and 17 repeater stations that link Houston to West

Early-day headquarters for Humble Pipe Line Company's expanding telegraph network was on 6th Floor of Humble Building in Houston.



Humble's communications office today is dotted with electronic equipment, including modern, automatic sending and receiving teleprinters.

Tall tower at Warda pump station is part of 400-mile microwave radio system which gives all-weather link between Houston, West Texas.

Texas and to all pumping stations on the Kemper-Satsuma pipe line. This system provides several telephone voice channels, a teletypewriter service, and is interconnected with the Company's existing wire facilities.

Humble's communications system today—38 years after its birth—includes approximately 30,000 miles of circuits connecting all Humble Pipe Line Company division offices directly with the general offices in Houston.

Division and district offices are provided with telephone switchboards manned by Humble operators. Teleprinters also serve these offices. Telemetering systems in some areas automatically transmit tank gauge levels, pump station pressures, and flow from the field to the division dispatcher's office.

One of the more recent technological improvements is the transmission of coded oil run tickets from field offices onto perforated paper tape in the Houston Office. Data on this tape are translated by modern office machines onto punched cards for use with electronic computers.

All branches of Humble Oil & Refining Company also have shared in the use of this communications system through the years. Personnel reports, drilling instructions, early-morning drilling reports, and other Company business have been carried by the system since the first wire was strung in 1919.

In spanning the technological gap between Morse Code and microwave, Humble has traveled far in the field of improved communications. And the journey is by no means ended. In the years ahead, communications will continue to play a progressive role in the transportation of crude oil through pipe lines. New circuits will follow the routes of new lines across other countrysides, keeping up with Humble's underground railroad wherever it may go.

Baytown Refinery begins to take shape, growing out of a low, boggy rice field. In this picture, construction progresses on Battery A. Batteries of shell stills like this were among Baytown's first distillation units. All have been replaced with more efficient pipe stills.

MORE PRODUCTS FOR PROGRESS

Significantly, plans for Baytown Refinery were enlarged even while it was under construction

FOR a time, the word "refining" gave more atmosphere than actual meaning to the name of Humble Oil & Refining Company. When its charter was granted, the Company operated only the small Globe Refinery, which processed 300 barrels a day of high-gravity "freak" oil produced from a single well in the Humble field. Gasoline was hauled by tank truck and sold at service stations in Houston.

Expansion was not long in coming. In July, 1917, Humble bought a refinery from the Dixie Oil & Gas Company in San Antonio. A good market for gasoline and lubricants prevailed in that area, and along with the refinery Humble acquired four service stations —at Austin, Corpus Christi, Seguin, and Yoakum.

In 1918 the oil field boom at Ranger, coupled with an important oil discovery at West Columbia, began to point up the need for refining expansion. By 1919, the stage was set for some really dramatic developments in refining.

For some time, Humble executives had been eager to make lubricating oils to meet mounting demand. Gulf Coast crudes, in their opinion, were especially suited to this purpose. Early plans had been made to build a large refinery to make use of the increasing flow from the Goose Creek field, but Humble had to wait until money was available.

In April of 1919, H. C. Wiess, who had not until then taken an active part in the Company's business, was assigned executive responsibility for building and operating Baytown Refinery. Still in his early 30's, Mr. Wiess had gained some practical oil experience by managing the Paraffine and Reliance companies and other properties in which his family held major interests. He brought with him to his first big Humble job a degree in civil engineering from Princeton, a determination to learn all he could about the oil business, tremendous energy and industry, a passion for accuracy, and a strong interest and belief in technical research. All would serve him well in the years ahead.

Following sound practices of locating refineries at or near tidewater, Humble chose as the site of Baytown Refinery some 2,200 acres of low-lying, boggy, rice-field land on the ship channel 30 miles from Houston. Strategi-

cally, the site was well chosen. But the work and hardships of building a large refinery there would have discouraged any but the hardiest pioneers.

Rains turned the site into a sea of mud, and some who worked there during construction say they can remember when it rained 100 days straight. Even in good weather, lack of supply lines created grave difficulties. The nearest railroad was a mile or so away, and a shell road from Houston ended a mile from the site of construction.

Woods had to be cleared, a water supply provided, offices and storehouse built. High winds wrecked buildings; mud and mosquitoes made life unpleasant. Troubles were legion.

Doggedly the men worked on and, by degrees, the refinery was built. On May 11, 1920, the first oil was charged to stills. Formal completion was celebrated on April 21, 1921.

Significantly—and this set a pattern that it would follow throughout its existence—plans for Baytown Refinery underwent considerable change even before the plant was placed in operation. By the fall of 1919, for example, in response to growing demand for gasoline, management added 16 Burton pressure stills to refining equipment originally planned for Baytown. The function of these Burton stills was to crack gas oil for the production of gasoline. So many stills and other units (not called for in the original plans) were added that the refinery, originally estimated to cost $1 million or $1½ million, actually cost $10 million. But along with this came an increase in capacity up to 10,000 barrels a day.

Early difficulties—in use of equipment and refining techniques—had scarcely been overcome before Baytown underwent a program of expansion. In 1922, ten more crude oil stills were added, plus six steam stills for rerunning kerosene and processing light crudes. This brought about more economy, more capacity, lower unit product cost, and more uniform results in terms of product quality.

Original engineering crew, surveying the site for Baytown Refinery, takes a breather to strike a purposeful pose beside a fallen tree, sawed in lengths for easy removal. Picture dated 1919.

Scenes like this prove that old-timers' memories are clearer than one might suppose when they recall that the site of Baytown Refinery was "a sea of mud." Some say they can remember when it rained 100 days straight, and rubber boots sucked into the mud would disappear.

Along with expansion came reconversion and modernization—even though Baytown Refinery was still in swaddling clothes. In 1923 and 1924, Humble installed a number of new thermal cracking coils designed to produce more gasoline from a barrel of crude oil. An atmospheric still and a battery of 12 stills for running light crudes were also added.

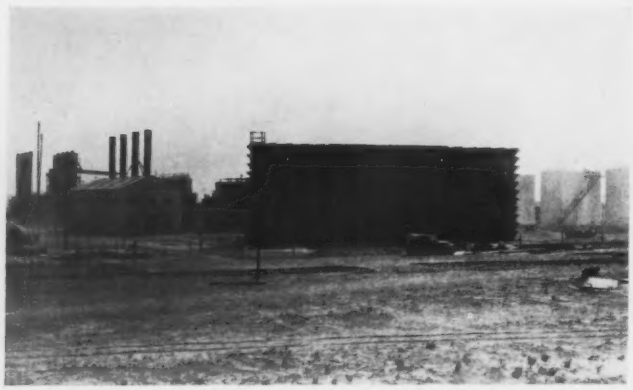
Emphasis Switches to Motor Fuels

The early use of cracking coils was significant. It marked a transition from Baytown's predominant role as a lube oil manufacturing plant to a complete, well-rounded refinery emphasizing motor fuels. In 1923, Baytown Refinery was still producing more lubricating oils than anything else. But by 1925, the value of its motor fuels outstripped that of lube oils, refined oils, and fuel oils combined. At the end of 1925, rated capacity of the plant was 50,000 barrels a day.

Although increasing emphasis was placed on gasoline production, Mr. Wiess remained interested in improving the quality of Baytown's lubricating oils. Research in lubricants began early under the leadership of Stewart Coleman. Mr. Coleman, who had already worked on Humble's refinery research problems, received his doctorate from the Massachusetts Institute of Technology in 1924 and went immediately to Baytown. In that year, Humble set up a separate organization for refining research.

As a result of work by Mr. Coleman

View of housing area under construction, 1919. Quick solution to housing situation was welcomed. Many employees had used tents earlier.



In earlier years of refining activities, small plants served the needs of local areas. Here is old McCamey plant, in West Texas.

Another of the smaller Humble refineries was this one at Colony Creek. Some of men here figured later in Baytown's development.

and others, Humble was able to improve its work with vacuum distillation and make changes to existing equipment, all steps leading to higher quality products. While the Company was not the first to use vacuum distillation, it developed the process on a large scale.

After 1925, Baytown began to hit an even more rapid stride. The following four years were marked by increased capacity and efficiency, more economical operations, higher levels of product quality, and considerable additions to equipment.

Well satisfied with its first venture into the use of thermal cracking coils, Humble decided to build more of them. By August of 1926, a total of 20 such units were operating. And this expansion had hardly been completed when further equipment was recommended. In 1927, two high-pressure Cross cracking coils were added, units which vitally improved the anti-knock quality of gasoline. Rated capacity of the refinery rose from 50,000 barrels a day in 1925-26 to 100,000 barrels per day in 1927.

During 1928 and 1929, emphasis at Baytown was on finishing equipment which would improve product quality. Five vacuum stills were added for rerunning kerosene and naphtha. A treater and a second agitator were built to improve finishing of refined oil. A sulphur-dioxide extraction unit was installed to remove sulphur from and improve the quality of refined oil.

In the midst of this expansion and improvement, critical eyes remained cocked toward more efficient and economical ways of doing things. Facilities were provided to recover naphtha from wet gases, preventing waste of gas vaporized from oil at the refinery. Other units designed to reduce vaporization losses and cut down other waste of light gases gave Humble at this time an admirably efficient vapor recovery system. As another economy measure, early in 1926, natural gas began to be used as plant fuel, instead of more expensive fuel oil.

Baytown's success in the late 1920's was marked by generally rapid advances in refining methods. Since the plant was new, management was not tied to, and had no vested interests in, older methods and equipment. They could, and did, take quick advantage of most recent developments.

An important milestone along Baytown's path of progress was establishment of the Technical Service group in 1929. An organization of chemical engineers, its function was to study actual operations closely and to be available for advice on ways to improve product quality and increase efficiency. A fine spirit of confidence, understanding, and cooperation soon cemented good relationships between the Technical Service group and process men in the field.

Another step forward was the organ-

As far back as 1917, Humble acquired a refinery at San Antonio, to serve the market for gasoline and lubricants which prevailed there.

Ingleside Refinery, on the Gulf Coast near Corpus Christi, and in size second only to Baytown, was shut down after World War II ended.

Billion Gallon Day, to celebrate Humble's manufacture of one billion gallons of 100-octane aviation gasoline, was observed at Baytown on December 14, 1944. Thousands of employees heard their efforts lauded by officials of the Company, government, and armed services.

ization of a Manufacturing Committee in 1929. Part of its duty was to consider problems aside from actual refining processes—such as accounting, record keeping, engineering, and employee relations. Work of this committee helped to integrate Baytown operations, bringing about still closer cooperation and understanding between groups.

By the end of 1929, Baytown was one of the largest, best-equipped, most efficiently operated refineries in the U. S. It faced the future with confidence.

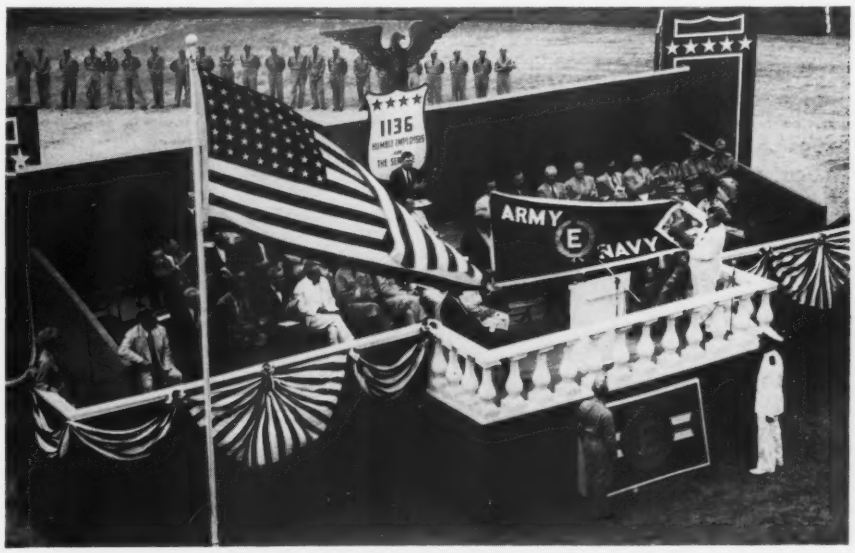
Adjusting to Depression

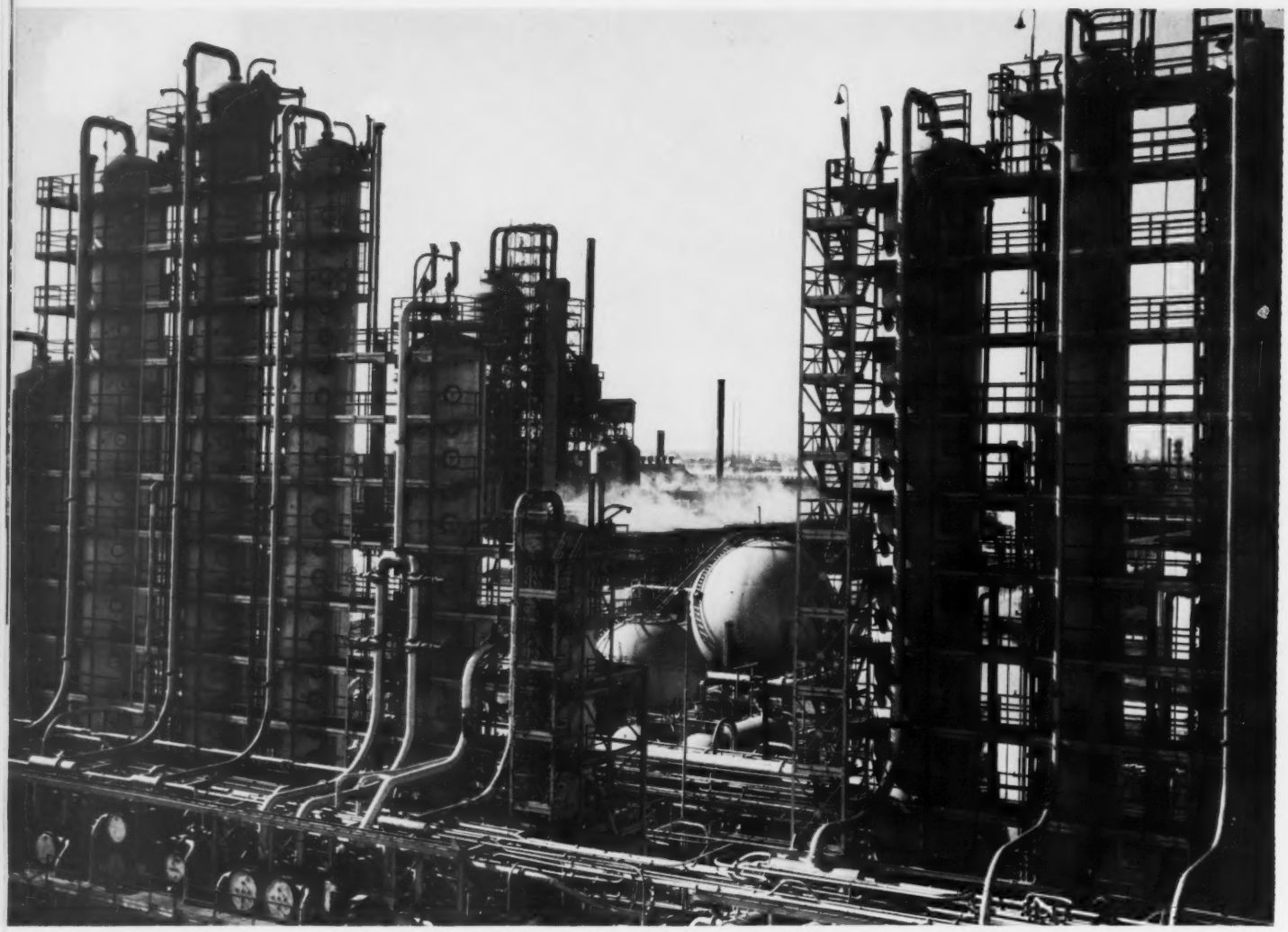
When sales and prices fell in 1930 and 1931, to mark the beginning years of The Great Depression, Baytown Refinery met the situation by contracting operations and searching for more economical ways of doing things. Even in these troubled years, however, new units and other equipment were added when it was shown that these would improve operations and lead to economies. In April of 1930, for example, Baytown's first pipe still was placed in operation—allowing far more efficient distillation of crude oil than was possible with the older-type shell stills. A new power plant was built, to relieve the refinery from having to buy outside power.

As the 1930's wore on, oil refining became a more and more highly scientific business. Humble, like other progressive companies, felt the growing need for emphasis on chemical research, on engineering, and on new skills. The work of technical service, and of the research and development groups, expanded during the middle 1930's, and work was divided into specialized sections. Central objectives

President H. C. Wiess displays Baytown's symbolic billionth gallon of 100-octane gasoline to Rear Admiral William W. Smith, Bruce K. Brown, and Major General Hubert H. Harmon.

Army-Navy "E" (for excellence) pennant is held up for employees and families to see. "E" was won several times by Humble for its contributions to all-out effort in World War II.





These imposing units at Baytown Refinery illustrate the complexity of equipment, as well as the tremendous investment, needed to meet enormous wartime demand for high quality fuels and oils. Behind these tall fractionation towers rises the No. 2 Catalyst Cracking Unit.

were to raise the octane rating of motor fuels and to improve lubricating oils.

Investment in fixed assets at the refinery moved steadily upward, even in depression years. Among important new units built in those years were the propane dewaxing and phenol extraction plants, which helped Baytown make great strides in increasing the production and raising the quality of its lubricating oils.

Other vital units built during that period were two new pipe stills, for greater efficiency in distillation, and new equipment for greater recovery and use of the so-called "light ends." In 1938, significantly, the world's first commercial alkylation plant was placed in operation at Baytown. Since alkylate has been called "the backbone of 100-octane aviation gasoline," this plant served Humble well when it began large-scale production of aviation fuels.

During 1935-38, several polymerization units were built at Baytown to increase the octane number of motor fuels. Then in 1939-41, three other alkylation units were added to the first one built in 1938. In turn, these made it necessary to build seven more light ends fractionation units, to separate those light hydrocarbons which could be used as raw materials for alkylation.

Baytown in Wartime

When World War II came, Baytown's equipment and its people were well prepared and ready, technologically, to do anything that would be asked of them. It was well that they were ready, for wartime needs skyrocketed the demand for aviation fuels, toluene for explosives, synthetic rubber, lubricants, and certain chemicals. Baytown quickly arranged its operations to secure the greatest possible production of war materials in the shortest possible time.

As early as 1940, Humble had authorized the construction of a fluid catalyst cracking unit, which offered a marked improvement over thermal cracking methods for converting fractions of crude oil into gasoline base stocks. When it was completed in 1942, the "No. 1 Cat" joined with other refinery units in moving Humble well to the fore as a producer of aviation gasoline. During the period immediately after Pearl Harbor, Humble produced about 20 per cent of all the 100-octane aviation gasoline made in the United States.

Even this was not enough. By mid-1943, plans were made for Baytown to produce about 20,000 barrels of aviation gasoline a day—and a year later this figure was increased to 30,000 barrels a day. Before Pearl Harbor, the

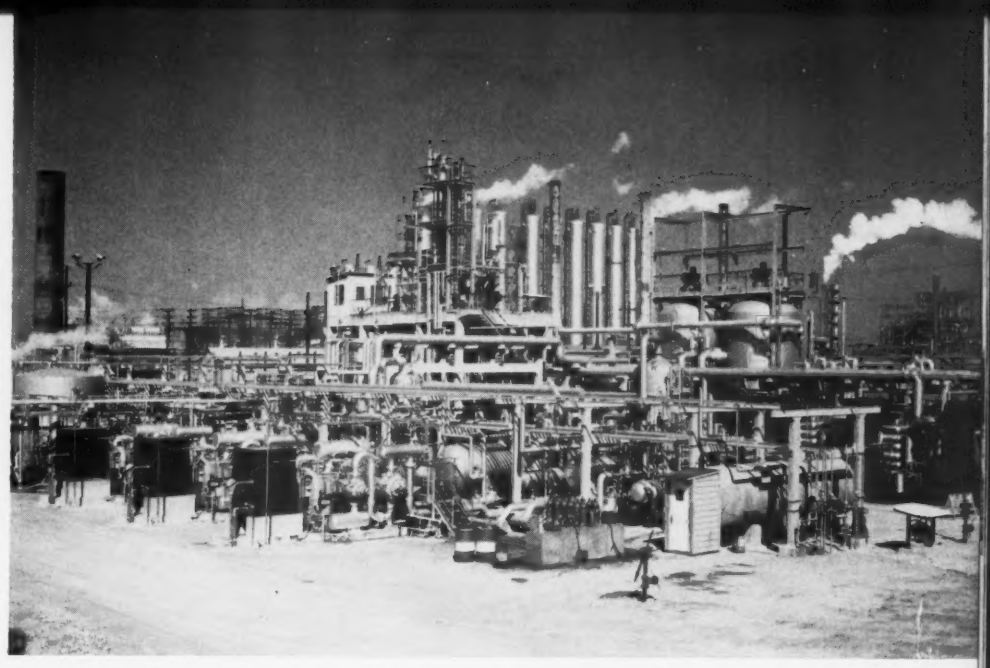
entire refining industry in the U. S. had produced only 44,000 barrels a day!

Still more equipment was needed to keep up with mounting demands. In 1942 and 1943, two isomerization units were built to help supply raw materials for alkylation. In 1942, another alkylation unit was placed in operation, and a naphtha fractionating unit was built to help produce high-quality aviation base stocks. Also in that year, a second fluid catalyst cracking unit—the "No. 2 Cat"—was authorized. By 1944, this unit helped increase the amount of raw material required for aviation fuels, for alkylates, and for materials to be used in the manufacture of synthetic rubber.

As a result of these efforts, Baytown produced and delivered during the war more 100-octane aviation gasoline than any other refinery in the world. On December 14, 1944, Baytown people celebrated the production of their billionth gallon of this vital war material. Theirs was the first refinery in the world to make that much, and one of only three to reach that goal during the war.

Another Humble contribution to the war effort was Baytown's production of toluene from oil—toluene being the final "T" in TNT for bombs and shells.

In the course of research on ways to improve gasoline quality, Humble men had discovered during 1937-38 a way of making toluene from oil. (Before this, toluene had been extracted from coal tar.) The Army urged that the process be developed for large-scale production, and by the fall of 1940, work had begun on the Baytown Ordnance Works. It began producing toluene six weeks ahead of schedule in 1941 and was operated by Humble for the government.



Paraxylene Unit, completed in late 1952, illustrates Baytown's expanding effort in the field of petrochemicals. This unit produces raw materials for manufacture of a synthetic fiber.

Eventually, production at the Baytown Ordnance Works rose to twice as much as the plant was designed for. And, for some time, the plant produced about two-thirds of the nation's toluene. During the entire course of the war, the Baytown Ordnance Works turned out more than 5½ million barrels of toluene—nearly half the nation's supply of that essential ingredient of TNT.

When Japan captured the source of natural rubber supplies in the Far East in 1942, the U. S. was forced to begin a program for making synthetic rubber. Early in 1942, Humble entered into a contract with the Defense Plant Corporation to build and operate a butadiene plant for the government at Baytown. Butadiene, made from oil, is the main ingredient of the Buna-S type of rubber used in tires. That plant went into operation in September of 1943, and a month later a similar but smaller plant went into operation at Humble's Ingleside Refinery.

These attractive young ladies are wearing dresses and gloves woven from the popular synthetic fibers. Basic material for these comes from Baytown's petrochemicals.

The ink was hardly dry on the butadiene contract in 1942 before Humble entered into a contract with the Defense Plant Corporation to build and operate a Butyl rubber plant for the government. Butyl is the type of synthetic rubber used in inner-tubes, and the Baytown plant was one of three built in the United States and Canada during the war. The Butyl plant began operating satisfactorily in 1944. During the next year it produced about half the total amount of Butyl rubber made in the United States.

Besides high octane aviation gasoline, toluene, and synthetic rubber, Humble also supplied large volumes of navy fuel oil and extra-high quality aviation lubricating oils. It was able to do so because its equipment and methods for lubricant manufacture had been modernized, enlarged, and improved in the same manner as its facilities for producing motor fuels.

By 1945, almost 35 per cent of Humble's products were going to the war effort. Rated refining capacity was increased from 169,000 barrels a day in 1939 to almost 224,000 barrels a day in 1945—190,000 at Baytown and the remainder at Ingleside.

Baytown's war record was achieved in spite of shortages of steel and men. Humble increased its refining work week from 40 hours to 48 and put more oil through stills. As men were called into the armed services or were transferred to the toluene and rubber plants, other refinery men were trained

As a result of a long-range program, all mechanical shops at Baytown Refinery were consolidated. These air-conditioned shops, now under one roof, are superbly equipped and arranged for maximum efficiency.

to replace them. For its contributions to the war effort, Baytown Refinery received a number of the coveted Army-Navy "E" Awards for efficiency.

Post-war Refining

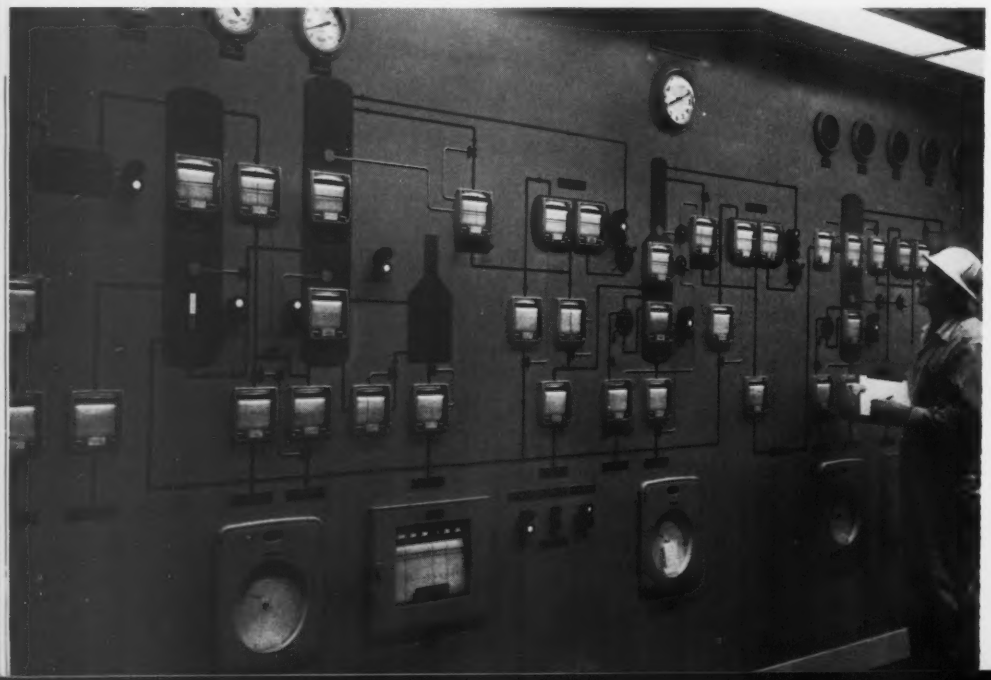
Many people believed that the end of World War II would bring a slackening in demand for petroleum products. With the end in sight, the government cancelled orders for toluene, and on August 20, 1945, the Baytown Ordnance Works was shut down. Orders were also cancelled for 100-octane aviation gasoline. Humble's Ingleside Refinery was shut down when butadiene contracts at that plant were cancelled. At Baytown, however, both the butadiene and Butyl rubber plants remained in operation.

As it turned out, civilian demands for petroleum products, especially for gasoline, was at a much higher level than had been expected. Baytown Refinery soon restored its equipment to full use. Early in 1947, the refinery broke all records by running 250,000 barrels of oil in a single day, and by May 8, 1947, Baytown had processed its billionth barrel of crude oil.

Demand for other products also exceeded the forecast. A few days after the Ordnance Works was closed, Humble reopened it under lease and began to make solvents for use in paint, varnish, insect sprays, and so on . . . as well as components for motor gasoline. Early in 1946 Humble bought the Ordnance Works outright from the government.

Research and technical service staffs turned their interest immediately from wartime to peacetime products. They worked chiefly on ways to improve product quality and obtain greater yields of the more valuable products from a barrel of crude oil. New automobile engines were built with higher compression ratios, and this called for better gasolines with higher octane numbers than ever before.

Expansion and improvement went on apace at Baytown Refinery after the close of World War II. Many additions were made to the plant's basic refining equipment. Scores of other units were modernized or enlarged, more office space was provided or improved, a new dock was built on the ship chan-



Control panel of modern unit presents a complex, but efficient, array of instruments which make it possible for a few men to control operations of large refining unit.

nel, and a number of outmoded units (such as shell stills) were dismantled. The first sections of a large Central Shops Building were occupied in 1949. It was designed to bring most mechanical crafts together under one roof for greater economy and efficiency. The Baytown Research Center, a 3-story research dream come true, was completed in 1951.

Progress in Petrochemicals

Of special interest and significance since the end of World War II is the upsurge in Baytown's production of chemicals from petroleum—the so-called petrochemicals. As intermediate raw materials and as end products, these find increased use in synthetic fibers, rubber, and detergents; in solvents, industrial alcohols, and fertilizers; and in a sky's-the-limit array of plastics and similar materials.

Some units which produce petrochemicals are relatively new at Baytown; others have been approved, and still others are in the planning stages. But Humble began to set the stage for this work years ago. The conversion of the Baytown Ordnance Works to peace-time production of aromatics and solvents for paints, varnishes, and the like helped to furnish some basic capacity for the production of petrochemicals, such as cyclohexane used in the manufacture of nylon.

In more recent years, Humble went boldly and broadly into other petrochemical fields when it bought the two synthetic rubber plants from the federal government. Even before that, a Paraxylene Unit, completed in late 1952, made Baytown a producer of the raw material for the manufacture of another popular synthetic fiber.

Raw materials from a number of other Baytown units (catalytic cracking, catalytic polymerization, naphtha fractionation, and the like) are used in a number of chemicals needed to make a variety of products such as synthetic rubber, detergents, and plastics. In fact, there are few basic refining units which do not contribute in some way to Baytown's petrochemicals program.

This program gains momentum with each passing month. Recently, 80 acres of land were set aside just across from the Hydroformer Unit and earmarked as a Specialty Area for new plants for the manufacture of chemical products. Work has already begun in that area on a Benzene Unit to be completed early in 1958. Other work is progressing on an Ethylene Unit, to be built near the third Catalytic Cracking Unit, now under construction. Still other petrochemical units are taking shape on the drawing boards, or in the planning stages.

While motor fuels and lubricants will continue to be Baytown's principal products, the output of petrochemicals is sure to move along at a steady clip. Production must be increased if Humble is to help meet increasing demands of American consumers for goods that make life pleasanter, more comfortable, and more convenient.

Two synthetic rubber plants bought by Humble from the federal government are shown in this aerial photograph. In the foreground is butadiene plant; Butyl plant is in background.

People Keep Progress

"Don't think that new and better equipment is the only kind of progress we've made at Baytown," said a Baytown Refinery executive not long ago. "Everybody has worked as a team to bring about that progress. All our groups have contributed to it—research, engineering, employee relations, mechanical, process, utilities, coordination, oil movements, clerical—any group you might name. No man, no department, no group could have done it alone. *It has been a team effort.*"

Going along with progress in the technical, mechanical, and manufacturing fields has been progress in safety, training, and employee health. Indeed, in the final analysis, all progress can be measured in terms of people's progress. For it is people—not machines or methods—that have put Baytown Refinery in its position of leadership. And it is people who will maintain its position of leadership in the years ahead.

Shift change brings out hundreds of people on bicycles to emphasize theme, repeated from founding to the present, that people are Humble's greatest asset.

Big truck trains like this hauled gasoline and other refined products from the Company's several small inland plants to wholesale and retail outlets in the surrounding market area during the late 20s—first big era of Humble's expansion in retail marketing.

FROM MODEST BEGINNINGS TO *Number One*

Forty-year review of Sales Department shows how three decades of minor successes and hard reverses paved the way to leadership in last 10 years

MARKETING operations were carried on from the day the Company was organized, though in a limited way for some years. The Globe Refinery at Humble, Texas, one of the properties consolidated in the formation of Humble Oil & Refining Company, processed about 300 barrels a day of "freak" crude from a single well in the Humble field. The gasoline produced from this volume was hauled to Houston daily in a Model T truck and was sold to operators of sidewalk pump "filling stations."

About two months after the Company was formed, it purchased the Dixie Oil & Gas Company in San Antonio, acquiring a small refinery there and four retail outlets located in Austin, Seguin, Yoakum, and Corpus Christi. In 1918 Humble bought the Lone Star Oil Company, acquiring in the transaction "four or five service stations in Houston."

By the end of 1918 Humble had established six bulk stations and was marketing gasoline and kerosene from its two small refineries and lubricating oils purchased from others through these wholesale outlets and through a handful of retail stations.

Buy Bonner Oil Company

It was in July, 1919, after the decision had already been made to build a major lubricating oil refinery at Baytown, on the Houston Ship Channel, that the Bonner Oil Company was bought. The head of this company, John S. "Uncle Johnny" Bonner, was made Humble's sales manager, and M. J. Monroe and his brother D. T. Monroe, who had joined Humble in 1918, were made assistant sales managers.

The physical properties of the Bonner Oil Company included nine bulk stations, some service station equipment, and merchandise stocks. Important assets were: an established reputation and position in the marketing of oils and lubricants to sawmills, railroads, and other commercial accounts in the Texas and Louisiana Gulf Coast area; and an employee group of some 50 people, 20 or more of whom were experienced sales people. This group formed the nucleus of a sales organization which, by the end of 1919, sold a respectable volume of products through 23 bulk stations and four retail stations.

During the next seven years Humble expanded its sales efforts essentially on the wholesale level. Baytown Refinery began producing in 1920, providing ample products of high quality in the

Small bulk stations, like this one at Angleton, served the Sales Department adequately during the mid-20s when major emphasis was on wholesale sales.

Baytown Bulk Station in 1928 shows the trend toward larger stations to handle the increasing volume developed through 200 new retail outlets.

MARKETER IN TEXAS

coastal area, and additional up-state bulk stations were built to handle the output of small inland refineries built at Burkburnett in 1921 and at Hearne in 1923. Direct tankcar sales supplemented the volume of bulk stations. Lubricating oils and some light products were sold in this manner, some to customers in the Midwest, but the volume was comparatively small.

Under the direction of then Vice President H. C. Wiess, gradual expansion of the Company's sales efforts had brought the volume for 1926 above the 2½ million gallons-per-month mark through an expanded system of 68 bulk plants.

"Our products," Mr. Wiess said at the time, "haven't the reputation that they deserve. Humble must attempt to retail more products and establish a more definite and direct contact with the consumer."

It was in 1927 that Humble's management took a step which was to have far-reaching effects on the Company's future in marketing. The decision was that a substantial foothold in the Texas retail gasoline market could best be gained by expanding wholesale outlets and by building and operating well located service stations to serve the motoring public.

Over a five-year period Humble built and placed in operation six small refineries, five inland and one on the Gulf: McCamey in March, 1927; Breckenridge in September, 1927; Chilton in December, 1927; San Antonio in January, 1928; Ingleside in July, 1928; and Neches in October, 1929.

Retail Outlets Built

Simultaneously the Sales Department organized the state into two divisions and set in motion a building program to expand its wholesale outlets and to build a chain of modern service stations. Frank A. Watts, present sales manager, was the Sales Department's chief engineer who supervised the great expansion of physical plant.

Outcome of this five-year program is best shown in figures such as these:

The number of bulk stations jumped from 68 in December, 1926, to 161 in the same month of 1931; four fee service stations operated by Humble in 1926 had grown to 244 five years later; long-term lease stations had increased from none to 69; and the estimated 500 dealers had increased to 681 in the same period.

The reward for this expansion was that Humble's gasoline business more than doubled through retail outlets in the five-year period. But more than merely increasing the volume of business, the vastly expanded operation brought favorable public acceptance—one of the major goals management had set. The retail stations were of modern and attractive design; they were conveniently located; and considerable emphasis was placed in the operation on courteous service and cleanliness.

Of equal importance during this expansion period was the fact that Humble also kept pace with competition in the matter of product quality. Mr. Wiess, always a strong believer in the scientific approach, had set up a product research organization at Baytown Refinery. From the laboratories of this

Service Station No. 4, the first retail outlet built by the young Humble Company, is a landmark at Main and Jefferson Streets in Houston. It is still being operated successfully.

group came new and improved *Flash-like* gasoline in 1929, equal in quality to any brand then marketed in Texas. Motor oil and other product research was also in progress, and it was in 1931 that two new products were introduced that were destined to have great impact on the future of Humble's Sales Department. These were Esso gasoline, a premium fuel of extra high quality, and 997 Motor Oil, Humble's first Baytown-developed motor oil, which was to offer real competition to the Pennsylvania oils.

The advertising campaigns of this era are of real interest. Esso gasoline was introduced to Texas motorists with newspaper advertising and on poster boards, which proclaimed the product as "The Giant Power Fuel, More Powerful than Any Gasoline."

A lengthy "teaser" campaign in newspapers had Texans talking and wondering about 997. What seemed like a strange name for a motor oil was actually an effective one—one that captured the buying public's fancy. The average boiling point of this new motor oil was 997 degrees Fahrenheit and it was 99.7 per cent carbon free. Hence the name.

A vigorous campaign of sales meetings was inaugurated, designed to inform the retail organization of product quality, to instill salesmanship, and to emphasize courteous and complete service to motorists. To support this program there was started in December, 1930, a monthly sales publication, known at first as *The Humble Dealer,* but with the third issue it became *The Humble Sales Lubricator.*

About 200 stations of this type were built by Humble during the 1927-31 expansion in retail marketing. In the past decade most of them have been modernized or replaced by new structures.

While all of this effort had the effect of more than doubling Humble's sales over the five-year period, it occurred in an era when all other Texas marketers were expanding rapidly and the state's economy was in an upward spiral. The era was reminiscent of an incident in *Alice in Wonderland,* where everyone seemed to be running fast but no one seemed to be getting anywhere. When Alice asked about this, she was told that in Wonderland you had to run fast just to stay in the same place; if you wanted to get ahead, you had to run even faster.

So, although Humble's sales had been doubled, small gain had been made in position. Humble occupied fifth place in the Texas market and had about seven per cent of the total tax-paid gasoline sales at the close of 1931.

Era of Retrenchment

Even while the Sales Department was finding for itself a place to stand, the specter of trying times showed on the horizon. By early 1932 the pall of depression was laying a heavy hand upon business and industry across the land. Almost simultaneously the great East Texas oil field roared in and inundated the crude oil market, dropping prices as low as 10 cents a barrel for East Texas crude at one time. This flood of cheap oil brought a serious break in the gasoline market. Lower consumption, distress prices, and a general economic decline confronted the Sales Department with the necessity of shutting down a large portion of its recently expanded plant.

In March, 1932, Stuart A. Giraud was appointed sales manager, with M. J. Monroe as assistant in charge of general lubricating business, tankcar and bulk sales, and D. T. Monroe in charge of service station operations. The marketing area was divided into six districts for decentralized operations, and a Marketing Committee was set up to guide the necessary retrenchment program and the continuing sales efforts.

Inland refineries, built earlier to supply surrounding areas with gasoline, became unprofitable and had to be shut down. Products from these plants had been hauled by truck trains to bulk stations or retail outlets in the immediate areas. When these truck trains were prohibited the use of the state's highways on January 1, 1932,

Big terminals like this on the products pipe line became the vital distribution centers during the post-war drive for leadership in Texas. From these, tank trucks deliver petroleum products economically to retail outlets; vans make direct deliveries of packaged goods.

and when refineries could no longer operate economically, the entire program was discontinued. Three small refineries were closed in quick succession: Breckenridge in July, 1931; McCamey in February, 1932; and Chilton in May, 1932. Other arrangements were made for gasoline supply in these areas, and 31 bulk stations which had been served by these plants were closed, including all such stations in the Trans-Pecos area. Except for this far western section, Humble continued to serve most of the geographical area formerly served. Bulk stations were closed or combined, and marginal or unprofitable service stations were closed, except where outlets were needed to assure availability of products.

Systematic but careful reduction of outlets cut Humble's retail stations from 994 in 1931 to 720 in 1934. During that same period, however, emphasis was put on good management and salesmanship, and the average volume per outlet was almost doubled.

In 1932, a research program started by the Production Department laboratory, in conjunction with the Refining and Sales Departments, developed a family of slushing type protective coatings. A Specialty Manufacturing Section was started and before long had added to the protective coating line a long list of cleaners, solvents, and household and industrial specialty products which found a ready market and added sales revenue. Today, the Rust-Ban family of protective coatings, the outgrowth of the effort of 25 years ago, is distributed on a world-wide basis, and many other petroleum by-products from the plant combine to add a significant figure to the overall annual sales volume.

Among the innovations designed to build public acceptance and increase business during this difficult period were these: establishment of Humble Touring Service in June, 1932, to aid motorists in planning trips; introduction of Service Check Cards in service stations in July of the same year; and inauguration of broadcasts of Southwest Conference football games as a public service in the fall of 1934. (The latter was expanded over the years and now includes broadcasting games in which Southwest Conference teams participate and telecasting as many games as are allowed on a regional basis by N.C.A.A.)

Consolidating for Effectiveness

The depression-engendered retrenchment program was about completed by 1935. By then Humble had reduced wholesale and retail operations to 50 per cent of the state geographically, but the area held 75 per cent of the state's population.

From 1935 to the outbreak of World War II the number of Humble retail outlets increased appreciably, due entirely to a 100 per cent increase in contract dealers. Actually the number of fee and leased stations declined, but more than 400 contract dealers were brought under the Humble sign. The net result was an increase in gasoline gallonage of 38 per cent over the six-year period.

Tankcar sales, primarily aviation gasoline volume, increased nearly six-fold. The Army Air Corps was the pace-setting customer; commercial airlines held second place. During the same period a sharp increase in sales of other petroleum products—Rust-Ban, paints, cutting oils, household products, road oils and asphalt, liquefied petroleum gases, and fuel oils—added materially to the Sales Department's income.

Still another addition to total revenue in this era was brought on when Atlas tires and tubes were stocked in Humble stations in April, 1935. Atlas batteries were added in 1938, and since then the line has been broadened appreciably and the revenue from it has increased substantially.

During this pre-war consolidation period product quality was maintained at a high level, advertising efforts were expanded, and continuing emphasis was placed on friendly service and cleanliness in retail outlets. A limited but effective sales promotion program was undertaken during the latter years

Specialty Manufacturing Plant, started on a modest scale in 1932, has been expanded to manufacture a wide variety of petroleum-based products.

of this period. Gasoline prices declined in the late 30's and made profitable operation difficult, so the Sales Department continued to dispose of surplus and unprofitable properties while carrying on a limited building and modernization program.

There was no significant change in the management or operating organization. In 1938 Stuart A. Giraud was elected Director in charge of Refining and Sales, a position he held until his death in December, 1940. He was succeeded by Hines H. Baker, who had been a Director since 1937. Mr. Baker continued the Marketing Committee system of management. He laid stress on continuation of sound marketing, the development of cost reduction programs, and aggressive advertising and promotion policies; and directed strong attention to the sale of a wide variety of products to the rapidly expanding industrial community in Texas.

When the darkening war clouds of Europe began to cast their shadows over this country in 1940, another serious adjustment confronted the Sales Department.

The War Period

The war years, 1941-45, brought to the Sales Department many operating problems, but sales volume went up. A large volume of aviation gasoline sales to the U. S. government, for use by Army and Navy air training fields, coupled with a growing increase in sales of products to industry, made the overall sales picture look better during these years.

Retail marketing problems changed from those brought on by competition to those brought on by war-time restrictions. Rationing of gasoline and tires, restrictions on transportation and on building materials, credit controls, and standardization of gasoline quality —all these brought new problems for the organization. Serious manpower shortages placed a heavy load on many of the older operators of retail stations. Some bulk plants were consolidated, and at others personnel was reduced. Although some dealer outlets were lost, due to lack of operators and reduced sales brought on by rationing of gasoline, Humble's retail volume held reasonably steady. Enormously increased sales to the U. S. government, to contractors, and to vast new Texas war industries brought average sales for the war years up to twice the volume sold in 1940.

Early in February, 1945, Hines H. Baker was elected Executive Vice President of the Company. He relinquished his responsibility for supervision of refining operations to H. W. Ferguson, who was named a Director at the same time, but retained his supervision of sales operations. In March, Frank A. Watts, a Company employee since 1919, was named sales manager, and Roy M. Stephens, who came to Humble in the Bonner Oil Company purchase, was named assistant sales manager.

Humble's Board of Directors had laid plans to strengthen the Sales Department after the war. Reorganization of the department was to be combined with improved product quality, expansion of sales outlets, better and cheaper transportation facilities, and an aggressive training and sales promotion program.

Post-war Drive to Leadership

This advance planning fitted right in with the Refining Department's ability to produce high quality gasoline in large quantities immediately after rationing was lifted in August, 1945. Within 10 days after VJ-Day, Humble placed on the market a vastly improved Esso Extra, and automobiles which had been struggling along on low octane wartime gasoline streamed into Humble stations and literally "purred" out. A very substantial octane leadership was maintained by Humble for several years, during which period the number of dealers more than doubled and the volume per outlet increased almost 60 per cent.

Contributing to the increase in outlets was the purchase of the marketing properties of the Texas-Pacific Coal and Oil Company late in 1945, when that company decided to discontinue its sales operations. Sixteen bulk stations and 28 controlled retail outlets were acquired, and a high percentage of the independent dealers under the TP sign joined Humble, thus providing the Company with additional representation in the Dallas-Fort Worth area and the central-west Texas section in which TP had marketed.

The next move which aided materially in the post-war sales expansion was the construction in 1946 of an 8-inch products pipe line by Humble Pipe Line Company from Baytown to the Dallas-Fort Worth area. This economical method of transporting large volumes of gasoline into the most heavily populated section of Texas gave the Sales Department a chance to make speedy and low-cost delivery from strategically placed terminals at North Houston, Hearne, Waco, and Irving between Dallas and Fort Worth.

During the early years of post-war expansion, reorganization of the field forces and training of many new employees was systematically undertaken. The marketing area was divided into four divisions, and each division was sub-divided into four districts. At division level complete staffs were set up to manage all phases of operations; in the districts, responsibility was specifically assigned to the district managers.

Training films were produced to give direction to the selling organization, and periodic promotion meetings brought Houston sales management in close personal contact with a large segment of the driveway sales force. All of these efforts were supported with expanded advertising through mass media and with a virile sales promotion program that kept enthusiasm high in the organization.

Supporting this overall program was management's policy of providing substantial capital funds for expansion of facilities. In fact, more capital has been made available to the Sales Department in the post-war period than in its entire previous history.

Golden Esso Extra was introduced in mid-1956, making Humble the first Texas marketer to offer three grades of gasoline to satisfy the octane requirements of all automobiles on the road.

Growth Leads to No. 1 Position

By 1948 this organized plan had tripled Humble's sale of gasoline over 1945 and had raised its marketing position from fifth to second place in the state. This accomplishment gave the entire sales organization heart to continue its drive and to keep first place as its goal. Continuing product quality leadership was maintained; contests and sales incentives were developed; and new territory was opened while the number of outlets was increased in old territory. By the end of 1950 the number of retail outlets had passed the 2,000 mark and the sales organization was within touching distance of its goal.

Humble assumed first place in tax-paid gasoline sales in Texas in October, 1951, and has not relinquished that position since!

As a postscript to this outstanding accomplishment, sales activities were expanded three years ago into the entire Panhandle of Texas, where Humble had not previously marketed. And two years ago still further expansion took the Humble oval back into the Trans-Pecos area of Texas and on into the state of New Mexico.

About mid-1956 Humble introduced Golden Esso Extra, a new premium over premium gasoline, to become the first Texas marketer offering the motoring public three grades of quality gasoline. Owners of high compression automobiles, by their acceptance of this pace-setting product, are re-affirming Humble's claim to quality leadership. Also, they are joining with thousands of other Texas motorists in making it possible for the Sales Department to maintain its position as No. 1 gasoline marketer in Texas—a position held for almost six years.

Attractive retail stations like this have been built in the Panhandle and Trans-Pecos areas of Texas, and in a number of New Mexico communities in recent westward expansion.

President Ross Sterling speaks to huge crowd of Humble employees. The occasion is that of the first Humble Day barbecue, held early in May of 1920, and shows graphically that family spirit was formed early. Site is now occupied by Refinery Community Building.

PROGRESS

"The greatest asset of a business organization is not the physical plant, nor processes, nor techniques; the greatest asset is the men and women who comprise the organization."

—HINES H. BAKER, President, 1948-1957

IN THOSE words, Mr. Baker was echoing the philosophy of the founders of Humble Oil & Refining Company. Acting on that philosophy, from the very first, the founders sought to deal fairly and honestly with employees. This was no patronizing attitude; it resulted from sincere feelings of duty and responsibility far beyond the usual employer-employee relationship of those days. Indeed, it was an outgrowth of a conviction among the founders that employees and management shared common interests and worked together toward common goals.

In a warm and personal first-names relationship of this kind, management's desire to be fair and do what was right ranged everywhere from paying "going wages or better" to extending financial help when illness or trouble struck a member of the Humble family.

Such an attitude, quite naturally, made for a strong family spirit and for a high degree of pride and loyalty. People who worked with Humble regarded the Company from a "we" viewpoint; not with a "they" attitude. No sooner had Humble been organized than the Board of Directors set aside Company stock, at par value of $100 per share, for employees who wished to buy it and thus become part owners of the Company.

Good pay and fair treatment, then, characterized Humble from its earliest beginnings. And in 1920, other important steps were taken which would attract good men and encourage them to make a career with Humble. On April 15 of that year, the Company adopted an Annuities and Benefits Plan for employees. Essentially, and briefly, the Plan contained these features:

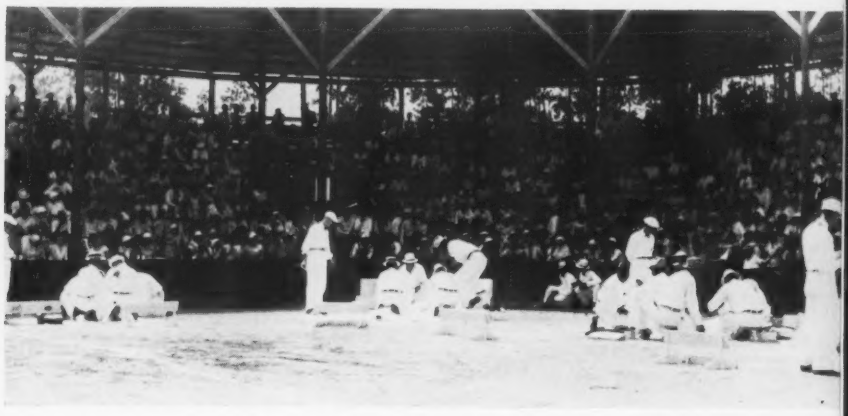
An annuity plan, with Humble paying all the costs for men retiring at age 65 (women at age 55), with 20 or more years' service.

A survivor benefits plan to help pay funeral expenses and ease family problems of readjustment during the period that followed. This plan provided, according to length of service, a minimum of $500 and a maximum of $2000—without cost to the employee.

A sickness benefit plan under which employees with one year of service could draw one-half pay for six weeks. Those with ten or more years' service could draw one-half pay for 52 weeks.

An accident benefits plan provided a benefit that, when added to payments

A basic Humble philosophy, from founding to present, is that employees and management share common interests and work together toward common goals



Fourth of July often found baseball field doing double duty. On this day back in 1933, men from Conroe District vied for top honors in first-aid.

SS THROUGH PEOPLE

made under workmen's compensation laws, equaled one-half pay—six weeks for one year's service; 52 weeks for ten years or more.

As the years went on, other features were added, each taking its place in a broad, comprehensive program. Today, as in the past, features of the benefit plans continue to be studied carefully and are altered, when desirable, to meet changing conditions and fit existing needs. As a recent example, the Annuity Plan was liberalized and modernized effective January 1, 1957.

Along with the original features of the Annuities and Benefits Plan, Humble early took one pioneering employee relations step almost without precedent. It adopted the policy of granting a vacation to everyone—*including all hourly paid employees.* A vacation with pay for employees generally was unusual in industry during the early 1920's.

Shorter Work Week

Another area in which Humble early showed concern for its employees was the matter of the work week and the work day. During Humble's first decade, days and hours worked had never been uniform. These had ranged all the way from a 5½-day week (44 hours) for office workers to 7 days (84 hours) for Production foremen, pumpers, and drilling crews. The one exception in Production was on the Gulf Coast, where it was customary for drilling crews to work only 10 hours a day, 7 days a week.

The 7-day week had been standard for a long time in the Texas oil industry. Everyone, employee and employer alike, accepted it as a matter of course, as part of the normal way of doing business. But in 1927 Humble set about to study the days-and-hours situation. In 1928, the Board sent John R. Suman, a new director, to the California oil fields, where progress had been made in employee relations and where in some cases shorter hours already prevailed.

Based on his findings on the West Coast, Mr. Suman recommended to the Board of Directors that all regular employees be granted "one day's rest each week without reduction of present earnings." The change became effective on October 1, 1928, and was followed not too long afterward with the 8-hour day. Far from bringing on evils, shorter work schedules increased efficiency and reduced costs.

A Department Organized

By the late 1920s, Humble's top management was convinced that an integrated employee relations program was needed. The Company grew steadily larger; its work steadily expanded and became more complex, more specialized—not only from a technological, but also from an administrative standpoint. The need for a separate and new department to handle employee relations matters was clearly apparent.

Accordingly, an Industrial Relations Committee was named to study the situation and make such recommendations as might be necessary to set up the new department. On that committee were H. C. Wiess, Vice President and Director in charge of Refining and Sales; Ralph V. Hanrahan, President of Humble Pipe Line Company; and John R. Suman, Director in charge of Production. It is significant to note that top operating men were appointed to this committee. To be successful, an integrated program of employee relations would have to be

Sylvan Beach, recently restored as a resort playground near Baytown, was a popular place for holding Humble Day celebrations. This scene harks back to 1923. Bandstand is ringed with "Model T's" and others of that vintage.

coordinated and applied to all Company operations.

Early in 1929, based on recommendations of the Industrial Relations Committee, a Company-wide Industrial Relations Department began to be organized. Immediately, some work which earlier had functioned independently and separately—such as safety, medical, and the annuities and benefits program—was brought into the fold of the new Department. In addition, a new Personnel group was added. Significantly, the Department's objective was as follows:

"To promote in every possible way a cooperative spirit in all levels of the organization so that the maximum amount of efficient work can be accomplished with the greatest individual personal satisfaction to employees."

Through the wording of that objective threads a philosophy that can be traced all the way back to the original founders of the Company. In it, too, can be detected the value of experience born of 12 years of wholesome and productive progress in the art of working with people.

It was well that Humble had chosen this particular time to establish an integrated Department to aid management in carrying out an employee relations program founded on the mutual trust and respect which had always marked relations between management and employees. For just ahead lay stormy and uncharted seas. Almost as soon as it had been organized, the Department would be put to stern tests brought on by the Great Depression, with all its ills and problems.

Employee Relations During Depression

The depression began to cause serious trouble for Humble by the end of 1930. Even then, no one knew how serious the problems of depression would become, nor how long they would last. Humble tightened its belt and prepared to meet whatever trouble might lie ahead. An employee relations program, designed to keep layoffs and hardships at a minimum, was adopted late in 1930.

Under that program, older and efficient employees would be laid off only as a last resort. Before that became necessary, overtime and contract labor would be eliminated; men would be transferred from slack operations to those which offered more activity. A program of repair and maintenance work was begun, to take up some of the slack. Everything possible was done to keep men working.

The 8-hour day which Humble had adopted earlier made it possible to get along during 1930 without laying off large numbers of employees. During 1930-33, the work week was in some cases reduced from 48 to 40 hours—then down to 32 hours. Some schedules were reduced to half time. Hours of office workers, including executives, was cut in mid-1932 from 44 to 40 hours a week, with pay cuts to correspond.

For the most part, employees approved—and were grateful for—Humble's share-the-work program. It meant less earnings, to be sure. But no change had been made in hourly rates, and part time work was much better than being laid off. And, if the depression was bleak in many ways, it also had some brighter sides for Humble employees. For one thing, management reviewed and re-evaluated some of the benefit plans during the period and made some changes which came at a most welcome time for employees.

Humble also took other measures to help employees in the early 1930's. It lowered house rents on Company houses and reduced installments on homes that had been bought by employees and financed by the Company. Humble also furnished prepared land and seed for employee gardens and provided canning kitchens for the use of employees in preserving fruits and vegetables. Employees were allowed to buy Humble products on credit and at substantial discounts.

Official acts, of course, do not tell the whole story of Humble's efforts to help its people in a troublous time. In

Not all employees took the "Model T" route to Sylvan Beach for 1923 Humble Day. The nautical minded sailed there on the good ship *S. S. Nichols.*

D. B. Harris (r) congratulates T. W. Moore on completion of 20 years' service as J. N. Beasley, G. H. Kelley, R. B. Roaper look on.

Safety meetings at regular intervals are part of every Humble job. On drilling rigs, a five minute meeting is held at beginning of each tour, or change of crews. Work of previous tour is discussed; all are put on guard for next tour's work.

many cases, when employees were faced with the loss of a home, or the sacrifice of stock, individuals in management personally came to their aid with private loans or other help. In other cases, executives personally arranged for employees to get loans from banks and other sources. And it must be remembered, at this point, that members of management were having their troubles, too—for depression is no respecter of persons or positions.

Humble first began to show signs of swinging upward out of the muck of depression when the Production Department started hiring more people in 1933. By the following year, things were getting better all through the organization. Concrete proof of this was a general five per cent living allowance granted on June 1, 1935, to compensate for increases in the cost of living. This raised the average employee's real wage up to slightly more than the level for the late 1920's—and the income was for 36 hours a week, instead of the 48 to 72 hours per week which prevailed during the late 20's. By the end of 1935, Humble people generally were well over the hurdles and out of serious trouble.

Advancement in the Thirties

After D. B. Harris took over the managership of the Industrial Relations Department in 1934, regional offices were set up in the Company's operating divisions, with Regional Managers in charge. These men were chosen because they had qualities of fairness and leadership, and because they had acceptance from employees and from top management as well.

Mr. Harris once said of these men:

"One thing I have emphasized to our Regional men is that they are not representatives of management any more than they are representatives of employees . . . There is nothing more important than relations with employees. Anything you do has to be done by coordinated efforts of people. I can't emphasize that too strongly."

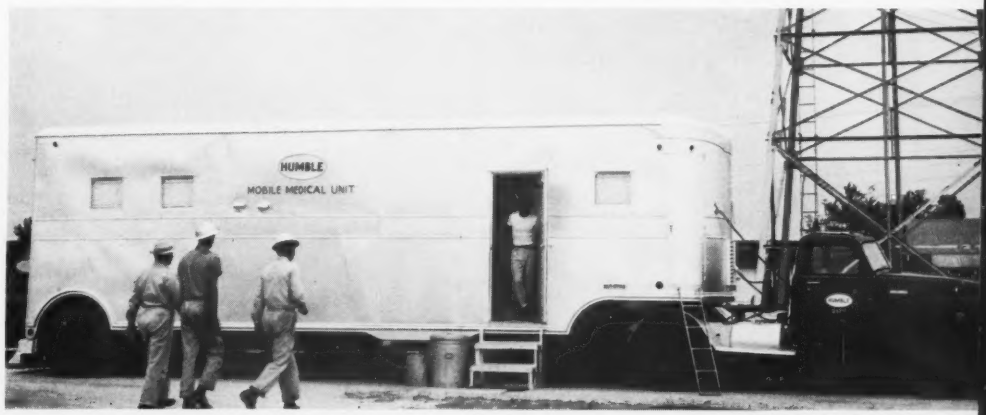
Clearly, then, Industrial Relations (or Employee Relations, as it was later re-named) is not a management group. It gives and enforces no orders; it is used in staff capacities. Its existence, however, reflects management's awareness and acceptance of its basic responsibility for a sound, workable program of employee relations. John Suman echoed that basic concept when he said:

". . . The responsibility for building and keeping good industrial relations is distinctly a function of management. And, I might add, no function of management is of much more importance than that of keeping the personnel in the right state of enthusiasm and morale. Any industrial undertaking succeeds or fails to an appreciable degree on the efforts and efficiency of the men in the ranks . . . It seems clear to me that management must accept the responsibility for building and maintaining good employee relations."

For 40 years, that has guided the thinking of Humble's management; it is a concept which management continues to regard as basically sound and necessary to a good organization. It is a way of life that continuously lights the way toward cooperation, understanding, and efficiency.

Clearly, the burden of responsibility for good employee relations rests squarely on the shoulders of management—and in such a situation the immediate supervisor carries a full share of the burden. Training in effective

Humble's Mobile Medical Unit—a compact clinic-on-wheels—travels far to bring preventive medicine to field employees. In charge of a physician, unit has a laboratory; a room for X-ray and other equipment for diagnoses; and an examing room.



Administrative Management Course is part of Company's training efforts. It trains men in supervisory principles, stimulates an awareness of management functions, points up need for applying sound principles, and emphasizes need for good human relations.

supervision with Humble had begun as early as 1930, when foremen training courses were offered at Baytown. These were followed with a series of discussion meetings held in field operating divisions as early as 1934. By 1937, specialized training for supervisors had come to be regarded as absolutely essential. In such training, men learned to cultivate qualities of leadership. And it was here that they also acquired a clearer understanding of the Company, its policies, and how to apply them.

Collective Bargaining

The history of Humble's collective bargaining activities underscores the Company's fundamental policy of fair dealing.

Back in 1920, the idea of letting employees express their own views through elected representatives was something new. Even in those early days, however, Humble management felt that better relationships would result from encouraging employees to express themselves on any matter, without fear of discrimination or reprisal. Accordingly, a plan was proposed under which employees would elect their own representatives to meet with representatives of management for the purpose of collective bargaining.

A meeting was held in Baytown on December 20, 1920, for the purpose of formally organizing the first Joint Conference Plan. H. C. Wiess, then Vice President in charge of Refining and Sales, was spokesman for the Company. His remarks on that occasion include the following:

"The proposed agreement, as well as creating a plan of joint conference, provides for non-discrimination by the Company or its employees against any employee on account of membership or non-membership in any church, society, fraternity, or union, and offers a fair and direct means of settlement of any problems for those that would seek it.

"You men probably feel, and I think that we will all find, that we are entering into a difficult undertaking, but we are going to undertake upon what is fair, and the success depends upon what is honest. If either side steps out to get the best of it, forgets for a minute that the requisite thing is fair dealing, it may fail, but our confidence in the men here and in the firm belief that they will deal fairly . . . is the factor that finally prompted the Board of Directors to make this proposal to you."

Later in that first meeting, E. E. Townes, then Director and General Counsel, had this to say:

"I have never seen yet a case where right thinking men get together and thrash things out and deal fairly but that questions are easily solved. If everybody understands the situation and wants to do right, that is the end of the fight. Some mistakes are bound to happen and we will all have to bear with each other in the mistakes we make."

Born and raised in such an atmosphere of mutual trust and respect, the Joint Conference Plan of collective bargaining flourished and was extended to other operations besides Refining. It provided a good and workable means for management and employee representatives to come together, talk over common problems, and reach conclusions that were fair to both sides.

The Wagner Act, however, passed by Congress in 1935 and upheld by the Supreme Court in 1937, made representation plans like Humble's Joint Conference illegal. At this point, management complied with the law by disassociating itself from the Joint Conference Plan. At the same time, the Company reiterated its policy of non-discrimination against any employee on account of membership or

non-membership in any church, society, fraternity, or union.

At once, employees set out to find other ways to bargain with the Company. This led to formation of independent bargaining groups known today as Federations. At present, 19 separate agencies within the Company bargain collectively for the groups of employees they represent. Two are affiliated with the A.F. of L.; one with the Brotherhood of Railroad Trainmen. The others are independent Federations.

Through the years, from past to present, labor relations at Humble generally have maintained a high plane of dignity and cooperation, based on mutual respect and understanding. Only this year, at a Federation meeting, one executive reminded the group of the founders' philosophy when he harked back to a statement once made by former President W. S. Farish: "Before you make a decision, ask yourself how it will affect employees." He then noted that this philosophy is still followed by Humble.

On another recent occasion, C. E. Reistle, Jr., Vice President in charge of Production, remarked, as a Federation meeting came to a close:

"Although it might be somewhat unusual, particularly during these times, for a group of people in an industrial enterprise to work together in almost complete harmony, there is nothing miraculous about it at all. All that is needed to maintain such a relationship is for those who direct the work and those who carry it out to be honest and to have the determination to do the right thing.

"No man of good will ever felt resentment toward another without a reason. There are times, of course, when supervisors and employees have honest differences of opinion, just as members of a family sometimes disagree. But where there prevails sincerity, understanding and the willingness to consider one another's views such differences more often than not help strengthen rather than weaken the relationships; and each side gains a better understanding of the other's problems and a deeper respect for the other's principles. There never was a real friendship in which the parties to it were in complete agreement on everything.

"Through their desire for fair play and their sincere interest in their jobs as employees' representatives, the men in the Federations have always been conscientious in giving management the facts as they saw them to be and this has been the real key to the solution of many a difficult problem. Your representatives have respected our thinking and we respect yours along with your sincerity in the way you have conducted your business. I appreciate it personally, for it has made my job a lot easier."

Health and Safety

Efforts and accomplishments in promoting health and safety are other examples of management's sense of responsibility for maintaining good employee relations.

As early as 1919, Dr. Charles M. Aves was employed as Chief Physician to set up medical facilities and a staff at Baytown while the refinery was under construction. From that beginning, Humble's medical staff has grown to include 10 physicians, 2 industrial hygienists, 10 nurses, 2 field nurses, 4 technicians, and a clerical force large enough to handle the great volumes of records and paper work necessary to serve more than 19,000 people. The Division is now headquartered in Houston and a modern and recently expanded clinic, fully staffed and splendidly equipped, continues to be maintained at Baytown.

Humble's Medical Policy clearly places emphasis on preventive medicine. Through constant study and effort, the Medical Division is finding out more about the stresses and strains, the health problems, and the mental and physical pressures that affect employees. Using this information as a basis for counselling, the staff is helping Humble people achieve a prolonged, useful, productive, and happy life span. Nothing is spared to improve health conditions on the job.

In addition to their other work, the Medical Division's staff of physicians, hygienists, nurses, and others make themselves available to further the cause of health in towns and cities where Humble people live.

As for safety, everyone in the early days knew about the dangers inherent in the oil business. But with charac-

Driver Training Program, designed to sharpen driving skills and point out areas for possible self-improvement, is constructive and popular with employees. Ray H. Horton, Director in Charge of Employee Relations, tries one of the manual tests himself.

Humble has always encouraged its people to learn more about their work. Training classes were being sponsored as long ago as 1919. Above, on-the-job type of training. Other types are classroom work, visual aids, meetings, and printed material.

teristic regard for its people, Humble set about at an early date to protect employees. The beginnings of a formal program may be traced back to 1922, when a "safety man" was appointed to study the situation and make recommendations designed to reduce the frequency of accidents at Baytown Refinery.

On July 1, 1929, safety work was expanded and R. B. Roaper was named to take charge of a Company-wide safety program. Constantly, tirelessly, the work of safety went on. Meetings were held; safety equipment was provided; protective apparel was adopted and men learned the wisdom of wearing it. Above all, it was a program of training to instill a safety-consciousness and develop safe working attitudes in employees.

Gradually, the accident curve was turned downward—first just enough to encourage, then in a manner that spelled real victory. Disabling injuries per million man-hours worked plummeted from 44.42 in 1929 to 23.21 in 1930. By 1932, it had been forced down to 12.74.

During the period of 1946-50, average annual frequency was reduced to a gratifying 5.85 disabling injuries per million hours worked. In 1952 and 1954 proud chapters were written into Humble's safety record. In those years, not a single life was lost through accident or injury on the job. And in 1952 only 69 injuries were sustained, pointing out the great progress made since 1929, when injuries stood at a dismal 1580! This record was made in spite of the fact that the organization had just about doubled in number of employees between 1930 and 1952.

Its safety efforts have won for Humble many top awards made by state and national safety associations. By the spring of 1956, Humble had won 37 top awards made by the Texas Safety Association during the first eight years of the Association's existence. During the past 28 years, the Company has also received 102 awards from the National Safety Council. It has also received great numbers of Accident Prevention Awards from the American Petroleum Institute.

World War II, and After

Like many other companies, Humble operated during World War II under the handicap of a manpower shortage. To keep up with mounting wartime demands for oil, a longer work week was adopted; remaining employees were in many cases trained to take over jobs vacated by those going into military service.

Realizing its obligation to those entering the armed services, and to their dependents, Humble adopted a liberal program which did much to lighten the financial burden created in many cases when employees were called to the colors. Those with as much as a year's service with the

Company received an amount equal to two months' pay when they joined the armed forces. If they had qualified dependents, they also received the difference between their armed service pay and their Company pay, up to one-half of their Company pay.

Nor was that all. Qualified employees in the armed services received their pro rata share of each year's additional contribution to the Thrift Fund, just as if they had remained at work. And those who returned to Humble and participated in the Annuity & Thrift Plan for one year received a full annuity bought by the Company to cover their period of military service.

Long before the end of the war, the Company had planned and made ready an elaborate program of rehabilitation and reinstatement to help smooth the way for servicemen who returned to work with Humble. Returning veterans, including those who were on temporary jobs at the time of entering military service, were returned to their old jobs or jobs of like status and pay—or were given jobs of a higher rating than the jobs they left. All of them received the advantage of general pay increases that were granted while they were in military service. In many cases, veterans' military experience had broadened their outlook and had qualified them for better jobs. In practically all cases, returning veterans fitted right back in, adjusting themselves to their jobs with a minimum of effort and trouble.

In post-war years, employee relations activities have been marked not so much by introduction of new plans as by constructive changes in the old ones.

In keeping with the general advance in the economy, wages and salaries have been increased repeatedly since the end of World War II.

Another significant phase of post-war employee relations has been the training of men to equip them for advancement into better jobs. The Training Division itself formulates and conducts some of these courses—such as those in Administrative Management, first introduced in 1949, and in Fundamentals of Supervision, begun in 1950. Under a program of executive development, designated employees are released full time from their jobs to attend courses in business management at various universities and to attend conferences and seminars on a variety of subjects.

In still other efforts of this nature, educators and specialists in their field are brought from all over the nation and from foreign countries to lecture before various technical and professional groups. For other employee groups, training has been accelerated in the crafts, in process groups, in office workers' skills—plus temporary training assignments and "job rotation" to give men a broader and better picture of Company operations.

Humble has made noteworthy progress since the end of World War II in all phases of a well-rounded and integrated program of employee relations. The effort is constant, the desire unrelenting, to make a job with Humble as good as, or better than, a comparable job anywhere.

And what is the result? One man who retired some years ago put it this way:

"I was always mighty proud to work for Humble. They did what was right and treated me fair. I could write all my complaints about the Company on a cigarette paper—then tear the paper in two and throw the blank half away."

The founders of the Company wrought well when they established and maintained, from the very first, a fair and honest program of employee relations. And others who followed them in management have clung steadfastly to the original philosophy of "doing what is right." For forty years, the program of employee relations—based on the bed-rock conviction that people are the Company's greatest asset—has been advanced and improved. Once set on course, that program has never swerved. Morgan J. Davis, who became President on April 29, 1957, reflected management's awareness of the importance of good employee relations when he spoke before the Humble Club at its annual banquet in 1956. Mr. Davis said on that occasion:

"Humble employees influence the opinion of others not only by the things they say about their Company, but also by the part they play as good citizens in their communities . . . The high regard in which the public holds Humble is largely a reflection of employees' feeling about the Company for which they work. It is also equally as much a reflection of the feeling of employees' families—their wives, husbands, children, and relatives . . . The Company appreciates this high state of morale and the part it plays in selling Humble to the public and in making work with Humble more pleasant."

Comradeship and the family spirit, fostered during their years as employees, remain with Humble people in retirement. This picture, made a few years ago, illustrates that point as annuitants gather for a chat across from Baytown Refinery.

Humble Stock Is Split Two-For-One

A two-for-one split of Humble Oil & Refining Company stock was approved April 29 at the Fortieth Anniversary meeting of shareholders.

At the meeting, shareholders of record at the close of business on March 11, 1957, voted to increase the number of authorized shares from 38 million to 76 million.

Humble's directors voted to make the stock split effective May 21. They also declared a second-quarter dividend of 70 cents a share on the existing stock, payable June 10 to stockholders on record May 21. This is equivalent to 35 cents a share after the approved split.

Production Department Honored For Safety Record

C. E. Reistle, Jr., Morgan J. Davis, Ralph J. Schilthuis

The National Safety Council has honored employees in Humble's Production Department for their outstanding safety record during 1956.

Employees in drilling, producing, and natural gas operations won first place awards in the Council's 1956 Petroleum Section Contest. The awards, designed to give recognition to oil industry employees for working safely, are presented each year to division winners in competition among the major oil companies.

About 6,000 employees were involved in the safety achievement—4,450 in producing, 832 in drilling, and 741 in natural gas operations.

The producing operations division had an accident frequency rate of 1.98 disabling injuries per million manhours worked in 1956.

Employees in Humble's drilling operations division had a 1956 accident frequency rate of 9.57 disabling injuries per million manhours worked. That rate is about one-third the oil industry's 1956 average for people engaged in the same activity.

The natural gas operations group had no disabling injuries during the year. In fact, that group had its last disabling injury May 26, 1955, and as of May 1 this year, had worked almost three million manhours since that mishap occurred.

Humble Announces Pay Increases

A six per cent salary increase, effective May 1, 1957, for all employees not covered by collective bargaining units, and a five per cent increase for the month of April, have been announcd by Humble Oil & Refining Company and Humble Pipe Line Company.

Also granted was an eighth paid holiday, and four weeks vacation after 20 years' service instead of 25 years' service.

The Companies also transmitted to bargaining agencies representing various groups of Humble employees their willingness to grant similar increases and liberalization in holiday and vacation policies.

Requests for increased compensation have been under active consideration by Humble for several months and in view of recent offers of wage increases by other companies the adjustments were made.

Watts Is Appointed To Petroleum Board

F. A. Watts

Humble Sales Manager F. A. Watts recently was appointed a member of the Military Petroleum Advisory Board by Fred A. Seaton, Secretary of the Interior.

Mr. Watts previously served as "Expert Assistant" to the Board and since 1956 as chairman of the Materials Committee, Materials and Manpower Coordination Panel.

Purpose of the Military Petroleum Advisory Board is to provide certain government officials with expert counsel, advice, and information on all oil and gas matters relating to national security and defense. The Board is made up of representatives of the military and the oil industry who have been selected to help each other, through the exchange of ideas, to provide an adequate supply of petroleum products to meet any emergency.

Mr. Watts' service to the oil industry-government team dates back to World War II. At that time, he served for two years as Director of Materials for Petroleum Administration for War. Later, during the Korean emergency, he returned to Washington for a year as Director of Materials for Petroleum Administration for Defense.

Lab Employees Set New Safety Record

Employees in the laboratory groups at Baytown Refinery have logged more than 10 million man hours of work without a disabling injury.

This is a new record for the laboratories. The last disabling injury sustained by any member of the organization was on April 14, 1947.

Participating in the achievement were the 550 employees in the laboratory groups in the Research and Development Division, Service Laboratory Division, and the Humble Inspection Laboratory.

Humble Receives Award For Reserve Program

The Humble Company received a citation from the Department of Defense April 19 for its "outstanding cooperation with the Reserve Program of the Armed Forces."

Brigadier General Robert M. Ives of the Texas National Guard presented the certificate citing the Company to Ray H. Horton, Humble director, at a luncheon meeting of the Military Affairs Committee of the Houston Chamber of Commerce. General Ives made the presentation for Lieutenant General John H. Collier, commanding general of the Fourth Army, who was unable to attend the meeting.

The citation reads as follows:

"Humble Oil & Refining Company is cited for outstanding cooperation with the Reserve Program of the Armed Forces. By its policy of hiring, promoting, and transferring Reservists without discrimination and by liberally granting military leave, assuring no loss in income, the Company assists its employees to meet their Reserve obligations and encourages others to participate. The Company also sponsors Company E, 143rd Infantry, 36th Division, of the Texas National Guard and provides men and equipment for the National Guard Armory whenever the need arises. The support given the Reserve Program by Humble Oil & Refining Company is evident in many other ways and is worthy of commendation."

Ray H. Horton Brig. Gen. Robert M. Ives Col. R. C. Crandall

Dr. Franklin

Dr. Franklin To Research For Bureau Of Standards

Dr. J. L. Franklin, research associate in the Research and Development Division at Baytown Refinery, left recently for Washington, D. C., to work 18 months with the National Bureau of Standards.

He will be on loan to assist in a three-year program of research on free radicals just undertaken by NBS. In this study approximately half of the researchers will be borrowed from industry. Others will be drawn from universities and various government agencies.

Free radical storage now promises to provide an important tool for the study of atomic and molecular physics, and for research in basic chemistry. However, before these applications can be seriously considered, much additional research must be done. It is in this type of research that Dr. Franklin will be engaged while in Washington.

Scientists were selected for this program on the basis of their competence in the field, and their interest in the new research problem. Dr. Franklin has engaged in free radical research at Baytown Refinery, and has had several scientific papers published on the subject.

McCarty, Furse Promoted In Production Department

R. R. McCarty and O. L. Furse received important promotions recently as a result of personnel changes in Humble's Production Department.

Mr. McCarty, former assistant superintendent of the Southwest Texas Division in Corpus Christi, was named superintendent of the Western Division in Midland effective May 1. He replaces J. W. House, who has recently resigned.

Mr. Furse, former assistant division superintendent of the East Texas Division, was named superintendent of the Eastern Division in New Orleans, succeeding S. S. Langford.

In other changes R. C. Granberry, former assistant chief petroleum engineer in the Petroleum Engineering Division, Houston Office, replaced Mr. McCarty as assistant superintendent of the Southwest Texas Division.

John G. Calvert succeeded Mr. Furse as assistant division superintendent of the East Texas Division, and H. H. Meredith, Jr., became East Texas Division petroleum engineer, replacing Mr. Calvert.

R. L. Pinion, Jr. was transferred from the Southwest Texas Division Office in Corpus Christi to the Civil Engineering Division, Houston Office, as a division civil engineer effective April 16.

Big Tanker Visits Baytown

Supertanker *Esso Gettysburg*, one of the two largest vessels of its type flying American flag, arrives on its first trip to Baytown Refinery. She is the largest tanker ever to call at docks and has a 318,000-barrel capacity, almost a tenth of daily oil production in Texas. *Gettysburg* is 715 feet long, has a 95-foot beam, and a top speed of 18.3 knots.

Humble Receives Health Achievement Award

Humble Oil & Refining Company received the Industrial Medical Association's "Health Achievement in Industry Award" at the Association's annual banquet in St. Louis, Missouri on April 24.

Ray H. Horton, Humble Director in charge of Employee Relations, attended the banquet to accept the award for the Company.

Ray H. Horton Dr. V. C. Baird

Established in 1949, the IMA yearly award is given to the management of a company in recognition of the inauguration and improvement of a comprehensive medical service for its employees.

Humble was cited for promoting sanitary, healthful working conditions; providing, when requested by employees, information and counsel on health matters; cooperating and consulting with employees' private physicians concerning health problems of employees; cooperating with local and national industrial health organizations and public health agencies in improving general health standards; and other services tending to encourage good health.

Exploration Department Changes Announced

Effective March 1, the following personnel changes were made in Humble's Exploration Department.

John L. Loftis, Jr., Division Geologist of the Western Division, was promoted and transferred to the Houston Office as Assistant Chief Geologist.

R. W. Bybee, Assistant Division Geologist in charge of the Roswell District Office, was promoted to Division Geologist of the Western Division in Midland, Texas.

W. S. Launey, Assistant Division Geologist of the Gulf Coast Division, transferred to Midland to replace Mr. Bybee as Assistant Division Geologist of the Western Division.

B. R. Payne, Division Exploration Geologist of the North Texas Division, was promoted to Assistant Division Geologist and transferred to the Gulf Coast Division as a replacement for Mr. Launey.

Vaughn M. Hubert, District Geologist in charge of the Abilene District Office, was transferred to the North Texas Division Office in Wichita Falls as Division Exploration Geologist, replacing B. R. Payne.

T. B. Stanley, Senior Geologist, serving in the Houston Office as a Staff Geologist, was promoted to District Geologist and transferred to Abilene, Texas to replace Mr. Hubert.

John G. Champion was transferred from Staff Geologist, Houston Office, to District Geologist, Tallahassee, Florida, Eastern Division.

Humble To Drill In Alaska

Humble Oil & Refining Company and Shell Oil Company have entered into an agreement to conduct joint exploration and producing operations in the Kanatak area of Alaska, southwest of Anchorage.

Humble will start operations immediately for the drilling of a 12,000-foot well at Cold Bay for the joint account of the two companies. Outside of the Kanatak area the two companies will continue exploration work individually.

The Humble Way

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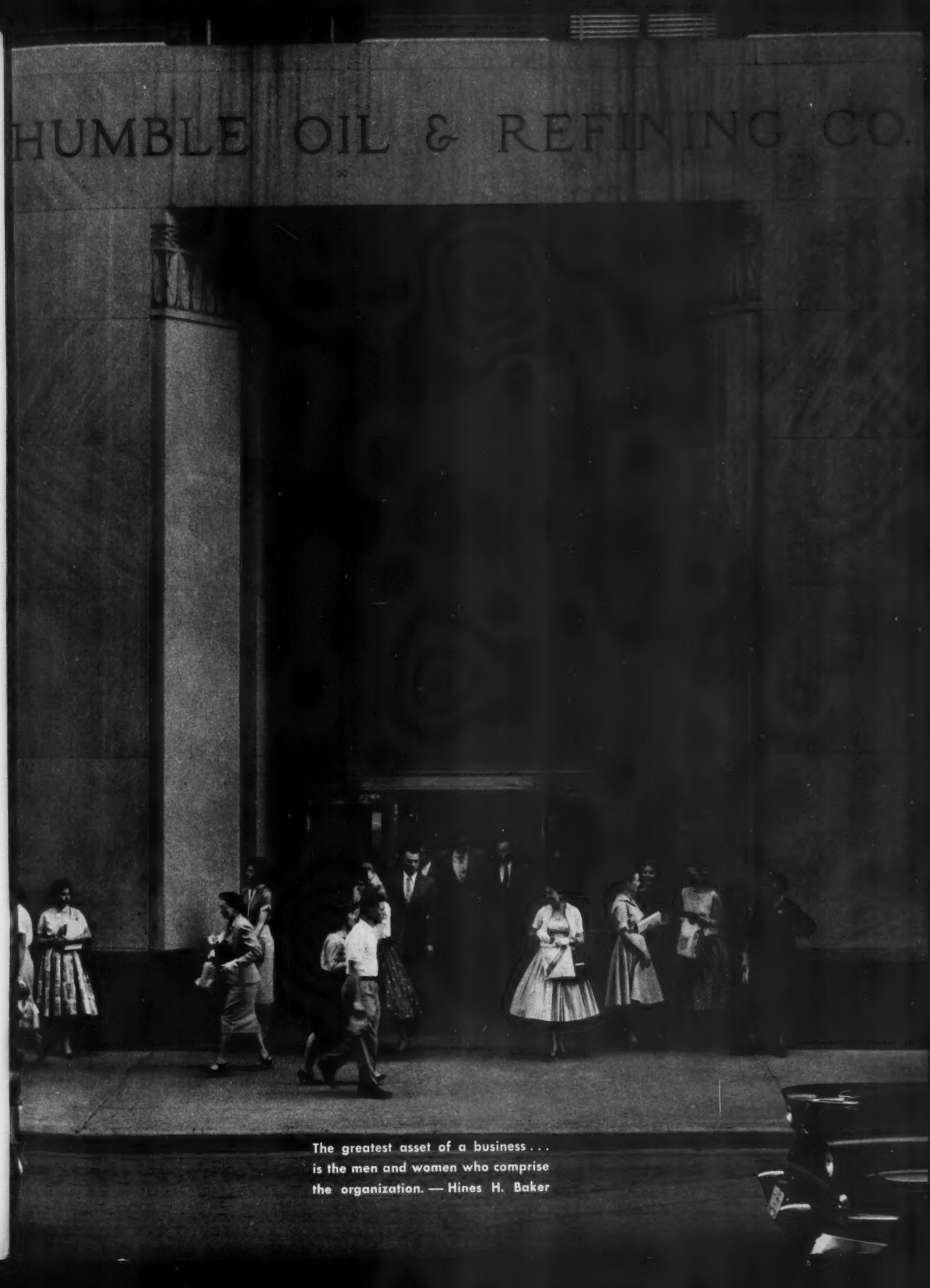

The greatest asset of a business . . .
is the men and women who comprise
the organization. — Hines H. Baker

40 YEARS OF PROGRESS